Cut comb honey in plastic bags, packed in display trays in counter cartons, a sure seller. Pack your honey attractively and cheaply in these beautiful containers. Well-drained chunks slip easily into the plastic bags and then fit snugly into open top display cartons. The bags are reusable in home and kitchen; the cartons are eye-appealing. The bags can be positively sealed from moisture, odors, and dust and prevent leakage. It's new — it's modern — it's effective.

Our FALL PRICE LIST gives further details about these brand new cut-comb bags and cartons, with prices. Also the fall price list prices and describes jars, pails, cans, comb honey wraps and cartons, shipping cases, honey selling helps; handling equipment and machinery. Send for your copy today.

Dealers Everywhere

What's Going On

Illinois State Beekeepers Assoc.
Northern Zone Meeting
Highland Park, August 26

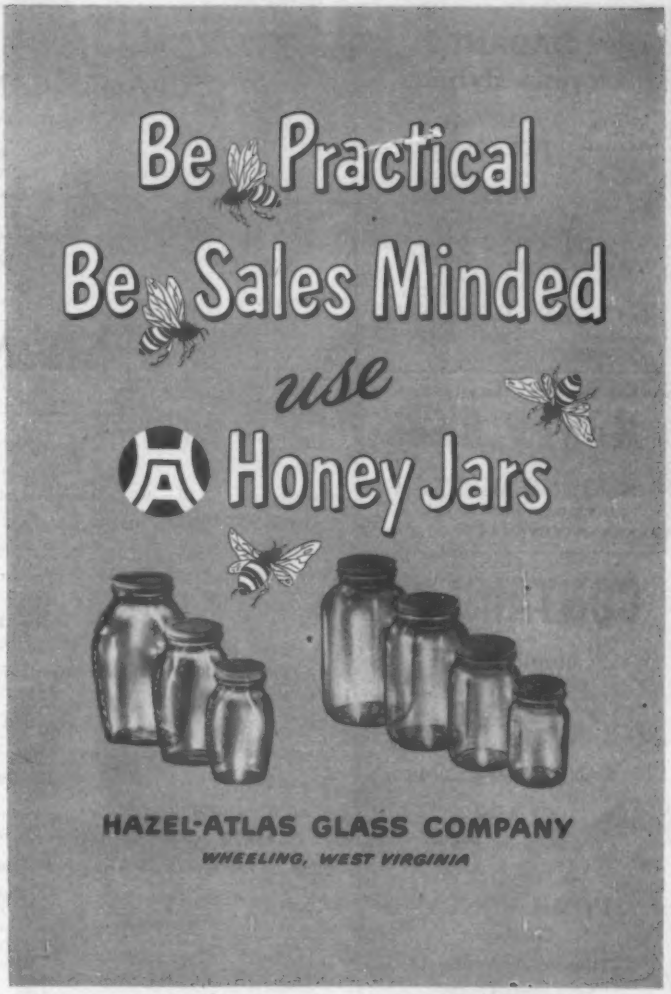
The Northern Zone meeting of the Illinois State Beekeepers Association will be held August 26, 1951 at the Boy Scout Cabin, Highland Park, east of Joliet. For those who live east, west, or south of Joliet, enter the park from U. S. 30 at Rock Island Viaduct. Those from Chicago area enter park from U. S. 6. There is a permanent marker on the south side of the road indicating the park entrance. Beekeepers' signs will be posted to assist in locating the meeting. There will be an all-day program starting at 10 A. M. with interesting speakers, music, contests, and a lunch at noon. Ham, coffee, and honey bread will be furnished. Bring table service and a pot luck lunch. Ladies should bring a cake baked with honey or sugar for the contest, and men should bring hammers for nailing frames contest.

C. M. Eggman, Sec'y
Will, Grundy, Kendall Beekeepers Assoc.

Western Missouri Beekeepers Assoc.
Swope Park, August 12

The August meeting of the association will be held August 12, from 12 noon until 7 P. M. Shelter house number 4 has been reserved in Swope Park and there will be prizes galore and several out-of-town speakers. This will be a joint meeting with several other associations in and around Kansas City including the Missouri Valley Association and the Independence, Mo. group. An invitation is extended to all beekeepers who wish to come.

Mrs. H. J. Schaffer, Sec'y.



The Cover Winner

Howard Graff, Bow, Washington

This month's winner writes us:

"We have three daughters: Joyce, 16, Myrna, 13, and Carol, the girl in the picture, who is 11 years old. They are all very good honey customers and all help in the honey house. When they were small I started giving them 25c every time they got stung and finally when one got stung the others were sure to be to get the 25c!

"I started with bees when I was sixteen when a neighbor gave my brother and me a box hive for picking four large cherry trees. I had always had a big appetite for honey and at the time thought my worries as to supply were over. However, as per the usual experience, my bees died the first winter and since then I have had the general run of luck with losses some years from floods, fire, bears and winter loss.

"After 1943 I started pollinating the apple orchards of eastern Washington and now have about 1200 colonies and four full time employees. At present, our honey packing operation is outgrowing the production business. We have a modern honey packing plant with a filter and pack and sell under the 'Silver Bow Farm' label. I have gotten more enjoyment out of my bee work than anything else I ever did and like most beekeepers would pick the same occupation if I had my choice again."

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A Complete Line—
Priced Right
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Box 249, Marshfield, Wis.

Volume 91, No. 8 August, 1951

THE AMERICAN BEE JOURNAL

HAMILTON, ILLINOIS

Editor—G. H. Cale
Associate Editors — M. G. Dadant, Roy A. Grout
Managing Editor—Adelaide Fraser

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CANADIAN BEE JOURNAL
Canadian beekeepers have much in common with their neighbors in the U. S. If you are interested in bee activities "North of the Border," send us your subscription NOW. Subscription price, $1.75 per year in U. S. A.
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2 and 3-lb., 12 in a carton.
5-lb. glass pails, 6 in a carton.
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•
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Applied by brush, spray or dip to the bare wood. Cuprinol will greatly lengthen the life of your hives by stopping rot. May be painted over. Does not offend bees. At hardware, paint and lumber dealers or direct. $4.70 gal.; $1.75 qt. Check or money order. No C.O.D.'s
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Welshpool Beekeepers' Assoc.
Invitation for September 13

The Welshpool Beekeepers' Association of North Wales is extending an invitation to all ABJ readers who are planning to visit England during the Festival of Britain to attend their Montgomeryshire County Show which will be held in Welshpool on September 13, 1951. The association invites beekeepers to bring with them samples of their honey and wax to enter in the Honey Section of the Show. Members of the Association will be glad to offer overnight accommodation on September 12 to fellow beekeepers from overseas. It is hoped that some of our readers will be able to take advantage of this generous invitation.

Welshpool is one of the historic gateways to Wales. The castle which overlooks the Show Ground and the River Severn is the residence of the Earl of Powys and is the only border castle still standing in its entirety. On most of the hills of the county are remains of British and Roman camps and in the town are many old coaching inns. This is a section of Wales packed full of folklore and legend which would be very interesting to the visitor from overseas. Scenes of the castle, the county show, and the village are shown on this page. (Pictures copyright C. D. Millington, Welshpool.)

More information may be obtained by contacting Mrs. P. Ecclestone, Honey Show Secretary, Tan y ilyn, Meifod, Montgomeryshire, North Wales.

New Jersey Beekeepers' Assoc.
Washington's Crossing, August 18

Due to the popularity of last year's Washington's Crossing meeting, the August meeting of the New Jersey Beekeepers' Association will again be held at Washington's Crossing, Saturday, August 18, at 10:30 A. M.

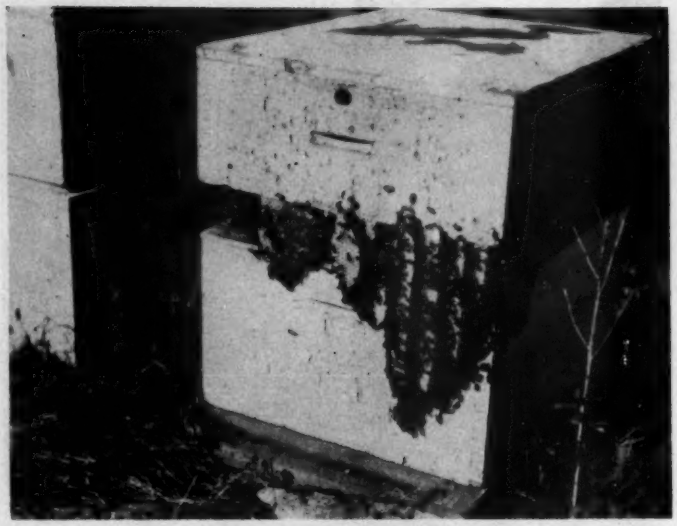
The meeting will be held in Green Grove on the New Jersey side of the Delaware River. When driving on the River Road, turn east on Pennington Road. There is a blinker light for identification; then proceed to the Grove. Signs will indicate directions.

There will be demonstrations on queen rearing and various methods used by various New Jersey breeders.

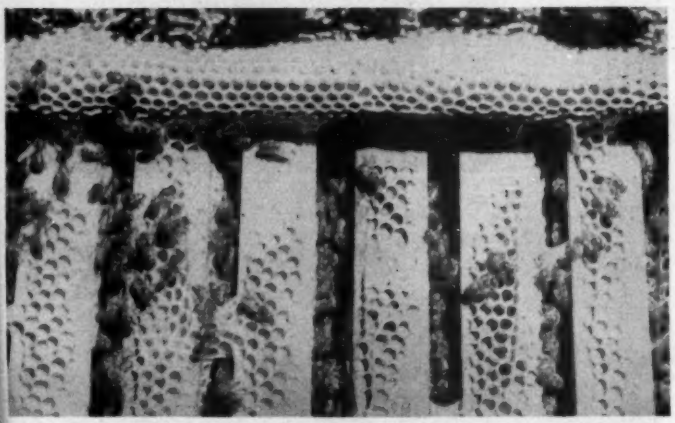
M. H. Stricker, Sec'y.

Saving Bits of Beeswax

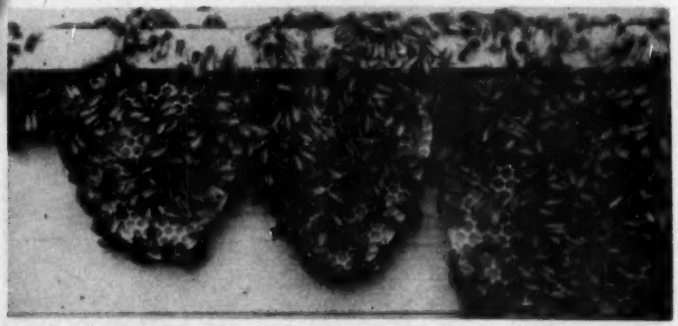
by Roy A. Grout



A crowded colony in hot weather sometimes will build comb on the outside of the hive. More often this happens in any empty space within the hive.



The comb formations on the top of the frames resemble burr combs, while the long comb built across the frames resembles a bridge comb and should be removed and saved.



This is the way that bees build comb in an empty frame. Combs of this kind often are built between widely spaced combs in supers or hive bodies, and should be removed and saved.

A very often neglected source of beeswax is the many bits of comb that are removed from the frames and other parts of the hive while working the bees. These consist of burr comb constructed on the face of wooden parts of the hive, particularly along the sides and tops of the frames; brace comb constructed between combs; bridge comb constructed between the bodies of combs; and unwanted combs constructed by the bees outside and within the hive when crowded for room during the honeyflow, but usually between frames that are spaced too far apart.

Particularly during the honeyflow and especially if diseases of the brood are not a problem, it is common for beekeepers to remove these bits of comb and to drop them in front of the entrance where the bees clean them of all nectar and honey. More careful beekeepers put them in an empty super above an inner cover to accomplish the same purpose. Such beekeepers usually collect these bits of comb and care for them properly. But the bits of comb which are scraped off in front of the colony more often than not are stepped on, forgotten, lost in the grass, or sometimes melted away by the sun's rays. The latter particularly is apt to happen when these bits of comb are placed on the top of the hive.

Burr combs should not be removed too closely except during the height of the honeyflow. It is contended that bees store beeswax in this form and use it later in comb building when beeswax is not being secreted. The other types of combs usually can be removed from a modern hive without detriment to the life of the colony.

It is well worth the consideration of every beekeeper to acquire the habit of collecting and saving these bits of comb. It is our contention that a beekeeper can save at least

a half pound of beeswax per colony annually in this way. It not only is wise economy but it will add to the total amount produced, and more beeswax is needed in the national emergency.

Usually the reason why these bits of wax are not collected and saved is simply the lack of a convenient container. Practically any sort of receptacle will do—from an old feeder pail to a gunny sack. Just get the habit of always taking a wax container with you while working the bees and it will surprise you how much you can save during the year's operations. The next thing to always remember is to take care of the wax when you get home each night. Put it into a closed container, or that solar wax extractor you have been planning to build for so long. Protect it from ravages of the wax moth and melt it up later or when a convenient time comes along.

Some years ago one of our bee men, then a growing young man, was told that he could have all the bits of wax he could pick up while working with the other fellows in the bee yards. At the end of the season, he drove up to his boss' house in a flivver. It didn't look like much; it rattled but it ran, and it was his first automobile. He invited his boss to come out and see what he had given him. "What do you mean, given you?" inquired his boss. "Why that car was bought with the beeswax you fellows gave me during the season," he replied.

Pollination Payments

The following information has been condensed from the May and June semi-monthly Honey Reports of the Federal-State Market News Service issued by the U. S. Department of Agriculture, Production and Marketing Administration, Fruit and Vegetable Branch cooperating with the California Department of Agriculture, State Office Building No. 1, Sacramento, California. By requesting to have your name placed on the mailing list, you can receive these reports free of charge.

In Oregon, orchard rentals for standard hives was $5.00 with an additional charge of $1.00 for Modified Dadant hives. Early clover rental was $4.00 and for vetch $3.00 in the Willamette Valley areas. Later clover pollination contracts were $8.00 with individual growers and $7.00 through cooperative groups. Most beekeepers preferred to take orders through cooperatives as they avoided collection difficulties. It was reported that placing bees in Ladino clover was very risky for they obtain little or no nectar from Ladino, and other nectar sources usually are not available.

In Washington, orchard rental fees varied according to the location. In the Yakima Valley and areas adjacent to beekeeping locations, rental charges varied from $4.00 to $6.00 per colony, while in the Wenatchee and Okanogan valleys, which are more distant from beekeeping areas, rental ranged from $5.00 to $10.00, mostly $9.00 to $10.00 per hive. Rental fees for bees placed in alfalfa was around $5.00 per colony. The fee in Kinland red clover and Ladino clover was $7.00 per colony.

In California, Ladino seed producers had made arrangements for bees for pollination and r e n t a l s were mostly $6.00 per colony for one to the acre. Others reported rentals at $5.00 per colony plus bonuses for more than stipulated yields of seed. Some 10,000 to 15,000 colonies of Orange County bees had been rented for pollination of alfalfa in Kern County with a rental of 1 cent per pound of seed produced. Some alfalfa seed producers still needed bees. Around 3,000 colonies were used in Sonoma County for pollination of prunes, apples, and cherries at a rental of $2.50 to $3.00 per colony.

Utah beekeepers received $2.00 per hive in cherry orchards taking over 30 colonies and $3.00 per hive under 20, but they were skeptical as to whether the long moves to the orchards were worthwhile. Nevada, Montana, and Idaho reported that bees were not rented for pollination.

The Colorado Honey Marketing Board of Control has issued a report entitled "Recommendations on Pollination" which is reported as follows: All colonies must meet the minimum standard of 1,000 square inches of brood with bees to cover.

(1) Cash basis—1 colony per acre, $5.00 each; 2 colonies, $5.50 each; 3 colonies, $6.00 each, and 4 colonies to the acre, $7.00 each.

(2) Share seed basis — 1 colony per acre, 1/5 of total seed crop; 2 colonies, 1/4 of the seed; 3 colonies, 1/3 of the seed, and 4 colonies to the acre, 2/5 of the total seed crop.

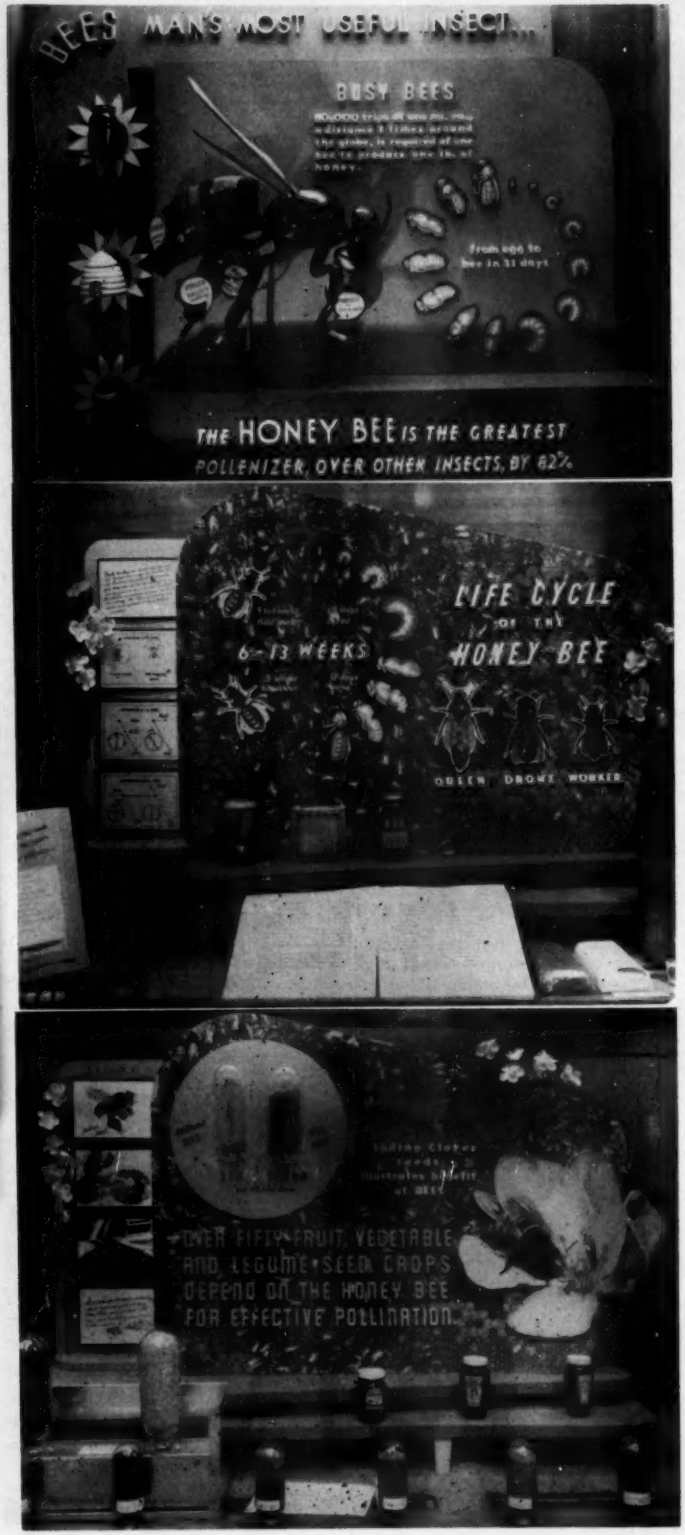
(3) Percentage basis — The number of colonies per acre is to be agreed upon between the beekeeper and the seed grower. For the first 300 pounds of seed per acre, the beekeeper receives 10 per cent; for the next 200 pounds, the beekeeper receives 25 per cent, and for everything over 500 pounds of seed to the acre, the beekeeper receives 33⅓ per cent. The seed grower also is to guarantee the beekeeper a payment of $4.00 per colony.

(4) Minimum fees for orchard pollination—For loads of 25 colonies or more, $2.50 per colony, and for loads of less than 25, $3.00 per colony.

ONTARIO WINNER

Winner of the F. Eric Millen Prize in Apiculture at the Convocation exercises held May 22 at the Ontario Agricultural College was Donald F. Peer, of T o r o n t o. The prize is awarded to the outstanding student in the Fourth Year of the Apiculture Option. Mr. Peer is now undertaking graduate work in apiculture at the University of Wisconsin under Dr. Farrar. (Photo courtesy Department of Public Relations, Ontario Agricultural College, Guelph, Ontario.)

Boatmen's Bank Goes


BEES MAN'S MOST USEFUL INSECT...
BUSY BEES
From egg to bee in 21 days
THE HONEY BEE IS THE GREATEST POLLENIZER, OVER OTHER INSECTS, BY 82%
LIFE CYCLE OF THE HONEY BEE
6-13 WEEKS
QUEEN DRONE WORKER
OVER FIFTY FRUIT, VEGETABLE AND LEGUME SEED CROPS DEPEND ON THE HONEY BEE FOR EFFECTIVE POLLINATION

Six of the windows containing this fine exhibit—a master act of honey publicity.

HOW we cooked up the idea of an educational exhibit on beekeeping for the windows of a bank in St. Louis isn't of material importance. The fact that the idea crystallized and the display took form is significant. What has been done, it is generally true, can be done again—and therein lies the value of the exhibit in question.

Of course, there have been displays devoted to beekeeping in many localities—the idea is far from new. But, the treatment of the subject, its educational character, the general public interest in bees in one of America's largest cities, give the exhibit its unique value.

If the display could be made a truly outstanding work and could arouse more than ordinary interest, an example would be set, with the attendant experience that could be followed in other communities, all to the advantage of emphasizing in the public mind the place of the honey bee in our general economy.

What went on in the initial conference between Bank President Tom K. Smith and Eastern Missouri Beekeepers' President, August P. Beilmann, has not been disclosed. Suffice to say, Beilmann sold a bill of goods . . . . and bank presidents are generally considered sharp bargainers.

Boatmen's National Bank is the oldest bank west of the Mississippi, and among the largest in the Middle West. Doubtless, the suggestion to devote the windows of the bank to beekeeping was so unique that President Smith recognized the opportunity to foster something of wide public interest in the community.

Executive Vice-president Paul W. Harper was selected to supervise the work. Frank Faquin, an exceptionally fine artist devoted to creating and producing display material, was commissioned by the bank to exe-

All Out for Honey Bees

by George C. Nagel

Secretary-Treasurer, Eastern Missouri Beekeepers' Association.

cute the eight layouts and install the exhibit. Shortly, Beilmann and I were invited to a conference. Neither Harper nor Faquin had ever seen the inside of a beehive. One snowy afternoon I escorted them to a St. Louis County apiary for their first introduction to beekeeping.

Now the undertaking was beginning to take shape. We couldn't just dump a lot of beekeeping supplies in the windows. Many conferences were held in the board room of the bank; ideas began to materialize. The exhibit must be educational in character. A theme must be provided. I hit upon the slogan, "Man's Most Useful Insect." It was adopted. This, naturally, led to the part the honey bee plays in pollination. The work of Beard, Dunham, and Reese, released in the Ohio Experiment Station Bulletin on clover seed production was brought into evidence. Now we were on our way!

The artist progressively prepared and presented large tissue layouts. Color values and combinations were studied. Since the project would be visual, photographs were in demand. Letters went out to Cale, Kelley, Allan Root, Dr. Jim Hambleton, Carl Killion, Woodrow Miller, and others. The cooperation received certainly was commendable. As the photographs came in they were studied and evaluated. Some could not be used because they duplicated apiary scenes depicted by other photographs. Scenes in commercial honey houses showing mass extraction and bottling would have found a place in the exhibit, but were not among those contributed.

Bees in their natural habitat, it was determined, should be included. Some forty miles from the city Beilmann discovered a bee tree. A section of the tree, requiring the efforts of four men to load, was carted to

(Please turn to next page)

the artist's studio, only to be returned for splitting up to fit the display. Fortunately, the cutting of the tree did not reduce the number of wild pollinators in its locality, since inspection showed natural predators had robbed out the stores during the winter leaving the bees without food.

Statements of the importance of bees in pollination might be subject to question by the uninitiated public. Ed Mangelsdorf & Bros., Inc., dealers in field seeds, very willingly cooperated by supplying the various samples of legume seeds displayed . . . . . It was recalled that a large model of a honey bee was used in the courses in entomology at our state university at Columbia. Beilmann journeyed to the state seat of learning and, through the courtesy of our State Entomologist, was loaned the model shown in the accompanying pictures of the windows. . . . . Counting copies of magazines, American and foreign, Honey Institute cook books, a cross-section of a hive, samples of pollen, both American made and foreign smokers, etc., the exhibit totaled 76 items besides a score of photographs.

The value of live bees in such a display was obvious. Observation hives had to be secured, and sources of frames of brood and bees established. As the project was studied, officers of the bank visualized crowds congregating around the one window displaying the observation hive and at the expense of excluding other material of possible interest, two observation hives were determined upon. Since the bank is located on a corner, one hive was displayed in a window on the Broadway side and another around the corner of Olive Street.

Sensing public interest, as the matter took shape the bank officials proposed permitting the receptionist in the bank lobby to distribute literature . . . . . Allan Root very kindly supplied reprints of the Ohio Experiment Station bulletin; Dadant furnished a supply of Roy Grout's booklet on Pollination; sample copies of Gleanings, American Bee Journal and Modern Beekeeping were stacked on the receptionist's desk, along with other leaflets and folders on beekeeping, pollination, etc. Every day or two I would receive calls from the bank for more literature.

Special recognition is due Carl Killion for furnishing display jars of pollen, a pollen trap, some of his fine section honey, and a copy of his new book "Honey in the Comb." (The latter, after it has been autographed by the author, will become a prized memento in the beekeeping section of your reporter's library, where will also reside the newest edition of "The Hive and the Honey Bee" which Roy Grout autographed for me.) Recognition, too, must go to Walter Kelley for lending his collection of European gadgets—a straw skep, etc.; to the Dadant organization, the Roots, and Dr. Hambleton of USDA, for the literature and magazines that were contained in the exhibit. I sustained a secret chuckle while inspecting the exhibit, myself, observing an elderly gentleman translating aloud the title page of the magazine Southwest German Beekeeper which Cale supplied with other foreign magazines. Certain that the exhibit held educational value, I dispatched letters to the Superintendent of Instruction of the St. Louis Public Schools and to the local Commissioner of Boy Scouts. That there was agreement in this was prominently brought to my attention later when, from my office window just across the street from the bank, I saw groups of school children observing the windows, accompanied by their teachers. Scout Masters brought their troops to see the show.

That public interest in beekeeping does exist, and to a wide extent among city folk, can best be suggested by the fact that, initially, the exhibit was scheduled to be shown for one month, but remained in place for six weeks—and then was removed with some reticence. The two observation hives were replaced seven times during those six weeks. This required round trips of 86 miles for each replacement, between Beilmann's apiary at the Missouri Arboretum and the bank in downtown St. Louis. Knowledge acquired by the officials of the bank that not only were fourteen brood nests necessarily disrupted but time on the part of both Beilmann and myself was required, helped make the decision finally to terminate the show.

And, believe it or not, the local Humane Society became interested, too,—and in a way not anticipated! The bank was advised that several phone calls had been received by the Society, complaining that dead bees were visible in the observation hives, a condition which could be considered cruelty to animals. The complainants doubtless had failed to read the signs in the windows calling attention to the fact that hidden from public view were feeders for both hives.

I prepared letters of explanation to the editors of our three daily newspapers which were prominently printed—and no further complaints came in . . . . . This was the only occasion when my name was used in connection with the display. Suspicion that I might be self-seeking in the part I was taking in the project urged me to remain unknown. But, in the release to the newspapers to counter complaints, it was necessary that my name be used as an official of Eastern Missouri Beekeepers. And now, contrary to fact, I am looked upon as an authority on beekeeping! The fat was in the fire! . . . . . The officer directing traffic at Broadway and Olive leaves his post in the middle of the street and wants me to point out the queen in one of the observation hives . . . . . Attorneys with whom I am acquainted in my office building insist upon my explaining bee culture to them . . . . . As I cross the street I hear: "Hi, Beekeeper!" . . . . . My office phone rings, and comes the question: "Is dis de man wat knows about de bees? Tell me, where can I get some goot ones?" . . . . . A society leader in St. Louis County, seeing my name in one of the dailies, commissions her maid to contact me to learn how bees that have taken up habitation in her guest house should be handled. "These important little pollinators must not be harmed, but they really do not contribute to the comfort of my guests."

And so, I give warning to each association secretary who may choose to promote a similar exhibit that he remain unnamed and strictly behind the scenes.

A discussion of the exhibit would not be complete without touching on its commercial aspect. Across the street from the bank is one of the Thompson chain of restaurants, very convenient for a cup of coffee. It was there today that I was introduced again to one of Missouri's former senators. . . . . I suggested to the manager of the restaurant that his establishment could take advantage of the display by featuring honey. This was done with announcements in the window and on the wall of the restaurant. How many guests were attracted is not known as this article is being written, but it is no conjecture as to the quantities in which restaurants may buy honey.

This brand new display streamer has been issued by the American Honey Institute. In warm shades of yellow and brown it carries the slogan: EVERYONE ENJOYS HONEY. Depicted on the 11 by 17 inch streamer is a typical, vivacious boy, licking his lips and holding a slice of bread spread with delicious honey.

The display streamer undoubtedly is intended to be used mainly in store windows, alongside displays of honey in food markets, and in many other ways to call the attention of the consuming public to HONEY. It is delightfully done, and we congratulate the American Honey Institute.

But this display streamer has a further use which we wish to recommend generally. We have written many editorials urging everyone connected with the entire bee and honey industry to HELP SELL HONEY—to do something each day to call the attention of consumers to this delicious, natural sweet of ours. Here is a streamer that should be prominently displayed in the honey houses and workshops of every beekeeper. It should be in the show rooms and on the office walls of everyone connected with the beekeeping industry — packers, manufacturers, editors, inspectors, scientists, and all other phases of the industry. It will help sell HONEY.

Another outcome has been the request, made by the president of the local Restaurant and Caterers' Association, for a speaker to appear at one of the organization's meetings. Our display called his attention to honey. Restaurant managers, as a matter of business, are constantly seeking new dishes. "But", he said, "We don't know how to use honey in the preparation of menus!" Herein lies an opportunity for the beekeeping industry to promote honey. What is required is a qualified authority who can lecture on the subject and demonstrate to restaurant managers throughout the country, at their local meetings, how delectable dishes containing honey can be prepared. Providing chefs and restaurateurs with recipe leaflets isn't the answer to the problem. Personal demonstration and discussion is the thing. . . . . Prepare the dishes as an invited guest speaker. Let these fellows sample them. Show how to prepare them. The result will be increased consumption of honey.

It is hoped that associations elsewhere will foster exhibits such as Eastern Missouri beekeepers have done here in St. Louis. It will be much easier than initiating it as we have done. My files show upwards of fifty letters written by the secretary, alone. President Beilmann could increase this total were his efforts added. You see, handling correspondence is always the secretary's job. But now that the pattern has been set, similar displays can be promoted with a good deal less time and energy.

What has been proved is the fact that the public is interested in beekeeping, and that interest can be made to pay off to the benefit of the industry at large. If we want to increase the consumption of honey in this country, we must put greater emphasis on our public relations. The more bees are brought to public attention, the more jars of honey will be removed from the grocers' shelves. More than the mere statement, "We have honey to sell" is involved. Interest in a product, regardless of how it is developed or whence it originated, is preliminary in any mass selling endeavor.

Breeding Improved Honey Bees

II. Heredity and Variation

by William C. Roberts and Otto Mackensen

U.S.D.A., Agr. Res. Adm., Bureau of Entomology and Plant Quarantine*

HEREDITY is concerned with the transmission of characters from parent to offspring. Animals of one species resemble each other, and this resemblance is due to heredity. Variations between individuals within any given species may be due to heredity or environment or both.

The body of the honey bee, like that of all the higher animals, is made up of many cells. Each cell contains a sort of cell within a cell, which is called a **nucleus.** Within the nucleus are the many genes, which are the hereditary determiners of form and function of all the parts and organs of the body.

Let us begin with the unfertilized egg. The egg is one cell having one nucleus and one set of genes. The genes are arranged in the nucleus in definite linear order on a series of string-like structures called **chromosomes.** The position of each gene on a chromosome is called its **locus.** A sperm cell also contains a nucleus with a single set of chromosomes and genes.

In fertilization the sperm enters the egg and its nucleus unites with the nucleus of the egg. Thus the fertilized egg nucleus has two sets of chromosomes and hereditary determiners.

In the development of an individual from the fertilized egg, the egg cell first divides into two cells and then the two daughter cells divide again. This process continues until the adult consists of millions of cells. Each time a cell divides each gene duplicates itself and all the chromosomes split longitudinally into two identical halves. These halves pass to opposite sides of the nucleus then divides into two. The cell then divides and each daughter cell gets one of these genetically identical nuclei. Each cell grows to the original size of its mother cell and the process of division is repeated. As growth proceeds there is an interaction between cells that determines the form and function of the body parts.

In the honey bee the queens and workers develop from fertilized eggs in this manner. Therefore all the cells in their bodies contain two sets of chromosomes and genes and are said to be **diploid.** The drone, however, develops from an unfertilized egg, has only one set of chromosomes and genes in all the cells of its body, and is said to be **haploid.**

During development reproductive organs are formed in which certain cells are set aside for the production of germ cells, sperms, or eggs. In the formation of the egg a cell division occurs in which the chromosome behavior is different from that in the multiplication of body cells. As a result of this division the egg has only one member of each pair of chromosomes, or one set of chromosomes and genes as mentioned at the beginning of this discussion. This mechanism assures the maintenance of a constant number of chromosomes in the species.

In most organisms a similar reduction takes place in the formation of the sperm, but as the honey bee drone has only one set of chromosomes no reduction takes place.

In the formation of egg cells it is a matter of chance which member of a given pair of chromosomes reaches a given daughter cell. It receives an assortment of 16 chromosomes (one member of each pair) that might range from all those from the queen's mother to all from her father or any mixture of the two. The genes on one chromosome usually pass as a unit and are said to be linked. Frequently, however, parts of a pair of chromosomes exchange places, so that an egg cell may receive chromosomes that are partly of maternal and partly of paternal origin. This exchange is called crossing over and, of course, increases the possibilities for variation tremendously by making many combinations of genes possible.

The separation of genes going into daughter cells followed by the creation of new combinations by fertilization is called segregation and recombination. This is the mechanism that brings about genetic variation between individuals in a family. Since in the honey bee all the sperms produced by a drone are i d e n t i c a l, no variation between sisters (queens or workers) is introduced from the drone.

All the genes at a certain locus may be the same and have exactly the same effect in one individual as in another. Occasionally a gene may change so that it has a different effect. Such a change is called a **mutation.** Both the mutant and the parent gene are then referred to as **alleles.** The new allele multiplies in cell division and may become common in the bee population if it has a favorable action. There can be several alleles at a single locus.

Let us consider a simple case of alleles in the honey bee. It has been shown that the difference between a mutant white-eyed bee and the normal or wild-type black eyed bee is due to the action of alleles at a single locus on one of the chromosomes. It has further been shown that the normal or wild-type allele for the black eye is **dominant** to the mutant allele for white eye, which is then said to be **recessive.** A dominant gene masks the effect of its recessive allele.

In genetics it has become customary to denote genes by means of letters. The allele for black eyes may be designated by a capital **W,** since it is dominant, and the opposing recessive allele by **w.** One of these alleles is located at a particular locus on one of the chromosomes of all honey bees. Let us call this the **W** locus on chromosome number 1.

* In cooperation with the Wisconsin Agricultural Experiment Station and Louisiana State University.

Since female honey bees have pairs of chromosomes, they can have any two of the alleles at this locus—WW, Ww, or ww. The WW and Ww genotypes (gene combinations) have black eyes, since W is dominant over w. The ww females have white eyes. Since drones have only one chromosome of each pair, they are either W (black eyes) or w (white eyes).

Inheritance of eye color in the female bee is thus duplicate and particulate. Each female receives either the W or w gene from its mother, and it also receives W or w from its drone father. Inheritance of eye color in the drone bee is particulate but not duplicate, for he receives either W or w from his mother since he does not have a father. The particulate nature of inheritance is illustrated by the gene W or w. In the drone if W is present the eye color is black, but it is white when the gene w is substituted for W.

If a queen bee has a W gene on both of her number 1 chromosomes, she is represented by the formula WW and is said to be homozygous for the W locus. Homozygous means likeness of genes. The drone can never be said to be homozygous, because he has only one chromosome of each pair and thus only one of the alleles, W or w.

Let us assume that a black-eyed virgin queen homozygous for W is mated to a white-eyed drone. The mating can thus be represented as follows:

queen = WW
drone = w
WW x w = Ww

Since the queen is homozygous, WW, all her eggs will have a W gene. All sperms from the drone will have the gene w, and the female workers or queen offspring of such a mating will all be Ww, or heterozygous. Since W is dominant over w and all offspring get one W and one w, the eyes of these females will be black.

Let us suppose that from one of these Ww fertilized eggs a virgin queen is produced. She will be Ww, or heterozygous for the W locus. Now let us mate her to a white-eyed drone that is thus w. Since the queen is Ww, she will produce eggs that will have only one of these alleles. On an average 50 percent of the eggs of such a queen will receive a W gene and the other 50 percent will receive the w gene. The mating and the offspring will be as follows:

(Please turn to next page)

INHERITANCE OF ABDOMINAL COLORATION IN TWO STRAINS OF HONEY BEES.

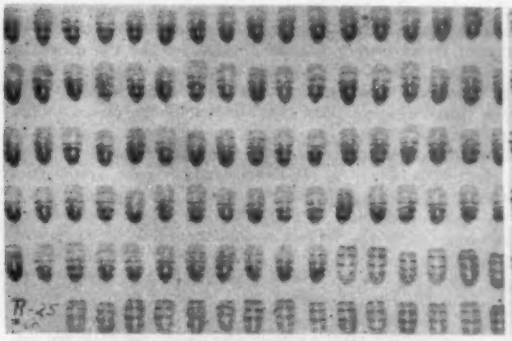


Figure 1. An inbred yellow queen artificially mated to a black drone produces worker progeny that are like neither parent but are banded intermediates. The first 4½ rows are abdomens of her worker progeny. The last 1½ rows are abdomens of drones produced by the yellow queen and are yellow like the queen because they develop from unfertilized eggs.

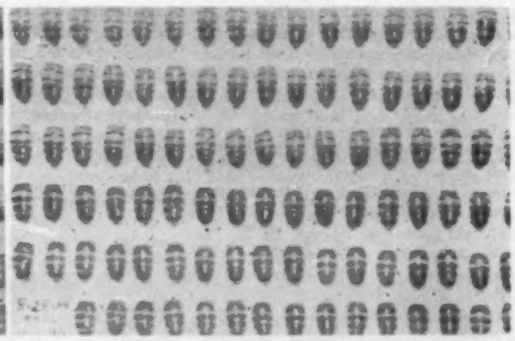


Figure 2. An F-1 hybrid queen intermediate in color mated to a black drone produces progeny that range in color from intermediate to complete black.

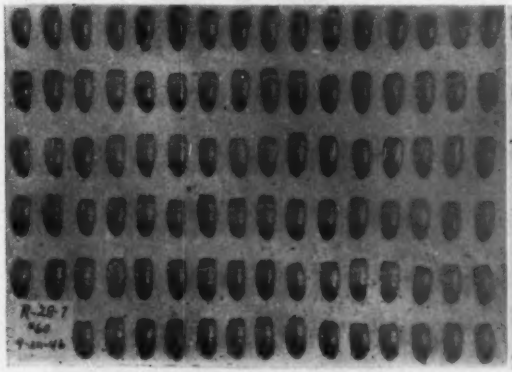


Figure 3. An F-1 hybrid queen intermediate in color mated to a yellow drone produces progeny that range in color from intermediate to parental yellow.

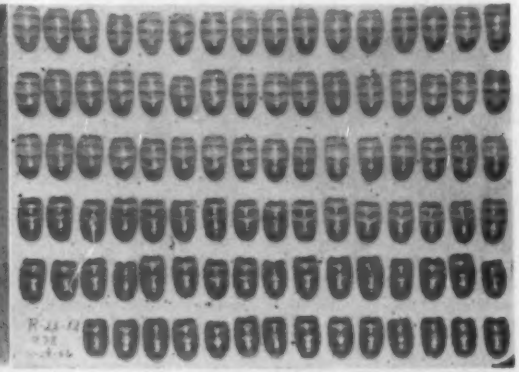


Figure 4. Drones produced by F-1 hybrid queens show gametic segregation for color. These range from yellow to complete black.
(Photos courtesy North Central States Bee Culture Laboratory, Madison, Wisconsin.)

queen = Ww eggs either W or w

drone = w sperm all w

Ww x W = 50% Ww heterozygous black-eyed females
50% ww homozygous white-eyed females

It can be seen that the heterozygous Ww black-eyed queen produces 50 percent of heterozygous black-eyed daughters and 50 percent of homozygous white-eyed daughters after mating to a drone that is white-eyed and thus w. Now this heterozygous black-eyed queen can produce both black-eyed and white-eyed sons, since her eggs have either a W or a w. Since these eggs can develop without fertilization, the W eggs will develop into black-eyed drones while the w eggs will develop into white-eyed drones. This illustrates how it is possible for a drone to exhibit and transmit to his offspring something that was not expressed in his mother, yet all his inheritance is from his mother because he has no father.

In the discussion of the W locus we have considered only two alleles, one completely dominant over the other. It is not always true that one allele is completely dominant. The heterozygous condition (such as Ww) may have intermediate effects. Furthermore, there can be several alleles of one locus that interact in various ways. When one considers that there may be thousands of loci with interaction of genes at different loci as well as interaction of alleles, it becomes apparent that the possibilities for genetic variation are tremendous.

Bees vary in many factors, not all of which are so easy to evaluate as eye color. It has been shown that there are at least seven different loci for genes that affect the color of the abdomen. Thus many abdominal color patterns are possible, since seven pairs of genes can produce 2187 different genotypes. If the workers of a mixed population are arranged according to color from the darkest to the lightest abdomen, they will fall into a continuous series.* Such a variation is said to be **continuous** in contrast to one such as white eye color, which is said to be **discrete**. In most characters of economic importance, such as honey production, egg-laying ability, vigor, or longevity, variation is continuous. Although such variation may be due to the interaction of a great many genes, it does not always imply a large number of inherited factors. It is possible that only a few genes are concerned and that much variation is due to environmental influences. These may be many and occur at various times from the beginning of queen rearing all the way through the life of the colony up to the time of harvesting the honey crop.

By a study of variation as such, we are never able to find out which part of the variation is certainly due to environment and which to heredity. The bee breeder must be ever alert and try to reduce the environmental variation to a minimum so that the variation he observes and upon which he bases his selection will be due to genetic factors. Queens in colonies to be compared as to performance should be reared under optimum conditions. (Queen rearing will be treated more fully in a later paper.) It is best to place the colonies in a single yard so that they will all be exposed to the same weather conditions and will have the same forage available. At the beginning of a performance test they should be equalized as to bees, pollen, and honey so that none start the test under a handicap. Colonies should be scattered and isolated as much as possible to prevent drifting and robbing.

The colonial nature of the honey bee makes the selection of breeding individuals particularly difficult. In contrast to the situation in most farm animals, the colony rather than the individual is the unit of performance upon which the selection of breeding individuals must be based. The colony performance depends upon the performance of a queen of one generation and all her worker daughters of the next generation. We cannot breed this unit. We can in effect breed the queen by using her sons, because, as we have seen, they represent her germ cells. For breeding females we can only use virgin queens that are sisters to the workers of the colony.

It has frequently been stated that a beekeeper can improve his stock, even though he may know little about animal breeding, if he is willing to make the effort. Nevertheless, one cannot find conclusive evidence that much genetic improvement has been accomplished.

Among the principles of breed improvement employed by early plant and animal breeders were "like produces like or the likeness of some ancestor," "inbreeding produces prepotency or refinement," and "breed the best to the best." In following these principles why did the bee breeder fail to make the progress made by the early plant and animal breeders? Inadequate control of mating and the difficulty of recognizing genetic superiority of individuals were factors that hindered progress. There is yet another factor that adds complexity to bee breeding, which was not understood until very recently. This is the inheritance of sex determination, and it is a very important factor because it is associated with egg hatchability. The relationship of sex determination to bee breeding is the subject of the next article.

* Inheritance of abdominal coloration in two strains of honey bees is illustrated in figures 1, 2, 3, and 4.

Honey Plant Work To Continue

Pellett Gardens at Atlantic, Iowa, where most of the actual plant work has been carried on as a cooperative effort with the American Bee Journal, is owned and operated by Frank Pellett's son Melvin and his wife Betty.

The Pelletts are all of an investigating frame of mind and Melvin and Betty are no exception. With the close tieup they had with Mr. Pellett, and with the garden at hand in connection with their market gardens, they should be in a position to carry on with the honey plant work, learning as they go. That is what they propose to do with our hearty approval and that of the many friends of Frank Pellett who have been so deeply interested. A number of new plants were received and introduced even after Mr. Pellett's illness which will bear watching, and they will be reported on from time to time in these columns.

In the meantime questions or suggestions on honey plants may be sent to Pellett Gardens at Atlantic, Iowa, or to us to forward to Atlantic.

The Effect of Honey Bees on the Pollination of Crimson Clover

by John M. Amos*

TENNESSEE produces 65 per cent of all crimson clover seed in the United States. The area harvested for seed increased from 11,700 acres in 1938 to 41,000 acres in 1947. The amount of seed produced averaged 241 pounds per acre, or about four bushels. Since 1942, the general trend of the average annual seed yield has been downward. Four bushels of seed at the present time is considered a good yield by most farmers and a high yield by many.

Howell, in U.S.D.A. Leaflet No. 168, states that "crimson clover is a prolific seed-producing plant; and seed yields of 5 to 10 bushels per acre are common, depending on the thickness of the stand, the amount of growth that is produced, and the care exercised in harvesting the seed. The florets are self-fertile; but bees are effective in tripping and transferring the pollen, with consequent increase in the number of seed per head. The placing of colonies of honey bees adjacent to blooming fields will effectively increase pollination."

So far as is known, no one has attempted to show how much the presence of honey bees will influence the yield of crimson clover seed. Limited work along this line was conducted from 1947 through 1949.

* Virginia Agricultural Extension Service, Blacksburg, Va. The observations reported herein were made while employed as State Apiarist in the Tennessee Department of Agriculture.

Reseeding crimson clover, the South's new magic carpet, is revolutionizing southern agriculture.
(Photo courtesy of Tennessee Department of Agriculture)

Methods

Approximately one colony per acre was used each season and placed in a pasture adjacent to the fields in which observations were taken. Cages four feet square were constructed of 4 and 16-mesh hardware cloth. No attempts were made by the bees to enter the 4-mesh cage in 1947, so 2-mesh enclosures were added in 1948. Cages were put in place when the earliest blossoms appeared in the fields.

Discussion

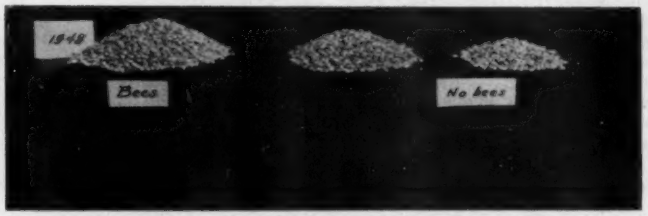
In 1947, the samples of flowers from the two 16-mesh cages yielded 1.28 and 2.57 gm. of seed. The seed from the 4-mesh cage weighed only 1.54 gm., whereas that from the area to which bees had access to the blossoms produced 5.29 gm. of seed, or more than twice the average of the caged blossoms.

This particular farmer did not think that he had an exceptional seed yield at the time he harvested his crop with a combine. However, his yield turned out to be slightly better than four bushels per acre. His neighbors obtained no more than a bushel and a half of seed per acre, and many failed to finish cutting the crop because the quantity of seed was too low.

The honey crop produced averaged about 45 pounds per colony.

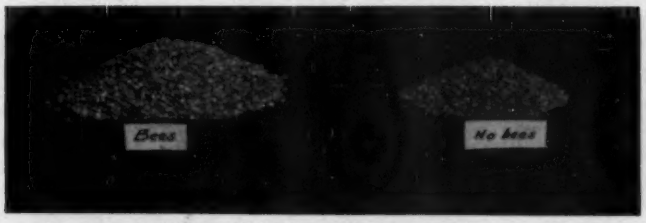
In 1948, cages were placed on areas of crimson seeded with barley as well as pure stands of this clover. Where bees had access to the blossoms, 8.41 gm. of seed was secured. From a like number of flowers from the 2-mesh cage, 5.66 gm. of seed was threshed; and from the 16-mesh cage, only 1.74 gm. of seed was obtained. As in 1947, the bee-pollinated plants produced more than twice as much as those from which bees were excluded.

Samples of seed from cages compared to the bee pollinated area in 1947.



Samples of seed from two cages compared to the bee pollinated area in 1948.

Samples of seed from two cages compared to the bee pollinated area in 1949.



Average seed yield from 50 heads over three-year period from caged and bee pollinated crimson clover blossoms.

When clover is sowed in barley, the seed yield is reduced by nearly 50 per cent. This may indicate that bees prefer to visit blossoms where flight is direct and is not interfered with by stalks of grain. Even so, the seed yield was more than twice as great outside the cages as compared to caged blossoms in grain.

Again, the farmer obtained a good seed yield; but the weather was dry during the blossoming period, and the bees barely made a living. Apparently, the pollinating task was done in search of pollen and nectar which was not very abundant. The beekeeper had to move the apiary to a vetch honeyflow to secure a crop of honey and to provide food for the bees.

During 1949, cages were placed only on pure stands of clover, and a check was taken nearby. Cages were more widely distributed than in previous years. In one of the 2-mesh enclosures, a bee was noticed in the cage; and it is interesting to observe that the seed yield for this cage was 6.3 gm., whereas that outside was 6.73 gm., or nearly the same. It is quite possible that this same bee, having found that the nectar content of the flowers within the cage was high, returned repeatedly to the same place for food, the cage serving as a mark to locate the source of an abundance of nectar. This is in line with known bee behavior. Excepting for this instance, the bees did not attempt to enter any of the cages. Excluding this cage and its check from the results in 1949, there was an average of 3.65 gm. of seed

produced in the cages, compared to 5.91 gm. on the outside. This represents an increase of one and one-half times in favor of bee pollination.

Weather was quite favorable for nectar secretion during the blossoming period of crimson clover, and a very good honey crop resulted. Strong colonies produced up to 150 pounds of honey, and the crop for the apiary averaged about 85 pounds per colony.

For the three-year period, omitting those results made on crimson clover in barley and the cage where a bee was known to have been present, the seed from 50 heads of crimson clover having bees available to them produced an average of 6.36 gm. of seed, as compared to 2.64 gm. from a like number of flowers in cages unattended by bees. This represents an increase in seed of 263.6 per cent, or roughly two and one-half times more seed, due to the activity of bees collecting pollen and nectar from crimson clover blossoms.

Summary

Over a three-year period, the amount of seed obtained from samples of flowers in caged areas was compared to that obtained outside where honey bees were active at the rate of one colony per acre. Bees increased the seed yield 263 per cent, or more than two and one-half times that where no bees were present. At harvest, 50 heads were taken at random from within each cage; and the quantity of seed obtained compared to that obtained from a similar number of heads collected outside where bees had access to the flowers. The seed was shelled out by hand, winnowed before a small electric fan, and weighed in grams.

The results obtained during the three seasons under observation are recorded in Table I.

Table I. Seed Obtained from 50 Heads of Crimson Clover.

	Wt. of Seed Gm.	Gm.
1947		
Bees (Plants not caged)	5.29	
Cage 1, 16-mesh per inch		2.57
Cage 2, 16-mesh per inch		1.28
Cage 3, 4-mesh per inch		1.54
Average for caged plants		1.79
1948		
Bees (Plants not caged)	8.41	
Cage 1, 2-mesh per inch		5.66
Cage 2, 16-mesh per inch		1.74
Average for caged plants		3.70
Clover planted in barley		
Bees (Plants not caged)	3.68	
Cage 1, 2-mesh per inch		2.40
Cage 2, 4-mesh per inch		1.46
Average for caged plants		1.43
1949		
Bees (Plants not caged)	6.73	
Cage 1, 2-mesh per inch		6.30*
Bees (Plants not caged)	5.67	
Cage 2, 4-mesh per inch		1.95
Bees (Plants not caged)	5.05	
Cage 3, 4-mesh per inch		2.21
Bees (Plants not caged)	7.01	
Cage 4, 16-mesh per inch		4.15
Average for plants not caged	5.91	
Average for plants caged		3.65
Average** (3 yrs.) plants not caged	6.36	
Average (3 yrs.) plants caged		2.64

* One bee noted in cage; omitted in averages.

** Clover interplanted in barley not included.

Hundredth Year Anniversary Langstroth Discovery

It was in late October of 1851 that L. L. Langstroth discovered the significance of the bee space in the hive and how it might apply to a completely new approach to the interior of the beehive. He set about immediately to do something about it and quickly devised the modern hive.

It is fitting that we should therefore mark this anniversary in our present beekeeping world. Already at the dedication of a new building for beekeeping at the University of Maryland, College Park, Dr. E. F. Phillips, the principal speaker, eulogized Mr. Langstroth and his effect on our modern beekeeping.

On July 22 in Old South Church at Andover, Mass., the church of Langstroth's first pastorate, the Massachusetts Beekeepers' Association held a memorial meeting and dedicated a plaque to memorialize Langstroth.

Later, date not specified, a bee garden will be dedicated to him in the Morris Arboretum of the University of Pennsylvania. The plantings will carry the name of Langstroth, although full details are not yet available. In that connection there appeared in the June number of the Frontiers Magazine, organ of the Academy of Natural Sciences at Philadelphia, a nice article on Langstroth by Fred W. Schwoebel who has been very active in having the memorial garden established. Mr. Langstroth was one of the early members of this academy after his return to Philadelphia from his pastorates at Greenfield and Andover in Massachusetts.

Langstroth's book was written in Massachusetts where he had gone in the fall of '52, or shortly after he had conceived the idea of the movable comb and had given it a trial. He returned to Philadelphia for his later years.

We are prone, these days, to give too little credit to the past generations for the benefits of the present. Surely Langstroth deserves equal credit with Whitney, McCormick and others in the rise of American Agriculture.

Permanent Glass Color Standards for Extracted Honey

by B. A. Brice,[2] A. Turner, Jr.,[2] J. W. White, Jr.,[2] F. L. Southerland,[3] L. S. Fenn,[3] and E. P. Bostwick,[3]

U. S. Department of Agriculture.

Color has long been an important factor in the marketing of extracted honey. In recognition of the importance of this factor, the Department established a color classification for extracted honey in 1927[4] and made it a part of the United States Standards for Grades of Extracted Honey. These colors are designated as Water White, Extra White, White, Extra Light Amber, Light Amber, and Amber. The official instrument for determining color classification according to these standards has been the Pfund wedge comparator, which has been described in previous publications[4,6] and is commercially available. This instrument contains a wedge of amber glass, a wedge-shaped cell for holding a honey sample, and a millimeter scale with pointer to indicate wedge positions where a color match is obtained. The boundaries of the color ranges, corresponding to the above color standards are specified[5] in terms of scale readings on this instrument.

The Pfund wedge comparator is satisfactory as a laboratory instrument but is impractical for field use. There is a great need in the industry for a simpler and less expensive grading device. Attempts in this direction have been made in the past by use of cylindrical bottles or tubes as sample containers and colored solutions or colored glass as material standards but without success in this country. The recent successful development of a simple color comparator with permanent glass standards for maple sirup[7] suggested application of a similar system to extracted honey. Tests made during the past year confirmed its suitability.

The purpose of the present publication is to briefly describe the new comparators and permanent glass standards for color classification of extracted honey and to announce their commercial availability. It should be pointed out that although the United States Standards for Grades of Extracted Honey have recently been revised,[8] the color requirements have not been changed but are now represented by permanent glass color standards for use in classifying the color of extracted honey. The permanent glass color standards are made a part of the revised United States Standards for Grades of Extracted Honey which became effective April 16, 1951. The Pfund wedge comparator may be used henceforth only for approximate color classification.[8]

Before glass color standards could be developed, is was obviously necessary to decide on a suitable standard thickness or layer depth of honey and a suitable sample container, for use in grading for color. Tests made with clarified honeys, selected and blended to correspond to the standard scale readings of the Pfund wedge comparator, indicated that 2-ounce square bottles having an internal thickness of 1.24 inch (31.5 mm.) met the requirements for satisfactory containers. The advantages of these bottles are: (1) they are inexpensive and available commercially; (2) the relatively large thickness of layer facilitates precise grading, since honeys of standard color are widely spaced on a color scale when viewed in this thickness; and (3) the square shape provides a field of view of uniform thickness and uniform color, a feature which would not be possible with cylindrical containers. These bottles should also be suitable and convenient for use as sample bottles in connection with the marketing of honey.

Selection of suitable colored glasses to be used as standards was done by means of spectrophotometric measurements on filtered honeys, solutions of caramel in glycerin, and commercially available colored glasses. Phillips[9] has shown that the spectral transmittance of honey is subject to variation depending on its source and turbidity. Our preliminary tests, however, showed that solutions of caramel in glycerin were good spectral matches and good color matches with typical filtered honeys, and that such solutions were more convenient than honeys as temporary secondary standards to aid in the development of glass standards. Caramel-glycerin solutions were, therefore, prepared which gave standard scale readings on the Pfund wedge comparator, and their spectral properties measured in 31.5 mm. thickness. Pfund scale readings and absorbance at only one wavelength are shown in Table I for these solutions. Commercial colored glasses were then found which, when ground and polished to our thickness specifications, duplicated closely both the visual colors and the spectral properties of the caramel-glycerin solutions (and hence typical

Table 1. The U.S.D.A. color standards, with scale readings on the Pfund wedge comparator; spectral absorbance of caramel-glycerin solutions corresponding to standard scale readings.

U.S.D.A. Color Standards	Pfund Wedge Scale, mm.	Caramel-glycerin solutions, Absorbance* at 560 mu	
		10 mm.	31.5 mm.
Water White	8	0.0300**	0.0945
Extra White	17	.0600**	.189
White	34	.119 **	.378
Extra Light Amber	50	.189	.595
Light Amber	85	.441	1.389 **
Amber	114	.979	3.008 **

* Absorbance (optical density) equals log10 (100/per cent transmittance) measured versus an equal thickness of glycerin.

** Calculated values.

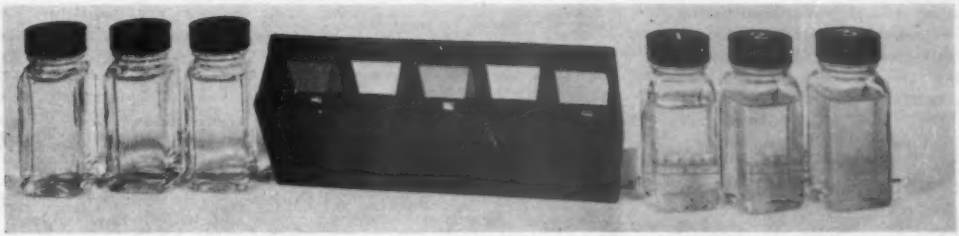


Fig. 1. Color classifier for extracted honey (rear view), showing the mounted glass color standards, the clear blanks, and the cloudy solutions.

Fig. 2. Color classifiers for extracted honey (front view), showing the blanks and cloudy suspensions in place behind the mounted color standards, and two samples of extracted honey to be classified. (U.S.D.A. photos by M. C. Audsley)

honeys) in 31.5 mm. thickness. A more complete description of the glass color standards with detailed colorimetric specifications will be published elsewhere. The Department has arranged for the purchase of a large supply of the selected colored glasses so that an adequate supply for the estimated needs of the industry is assured. All individual glasses are tested at the Eastern Regional Research Laboratory to assure close standardization of duplicate glasses.

The new color comparators (Figs. 1 and 2) containing the permanent glass color standards are all-metal boxes having dimensions approximately 8 by 2 by 3 inches, divided by thin partitions into five square compartments, each of which has two windows approximately 1.2 inch square. The three lighter glass standards (Water White, Extra White, and White) are mounted in one of the comparator boxes on a shelf against the front windows in compartments 1, 3 and 5. The three darker standards (Extra Light Amber, Light Amber, and Amber) are mounted in a similar manner in a second comparator box. Three square sample bottles filled with distilled water (referred to as "blanks") are placed in the compartments behind the glass standards in the comparator being used for grading. Empty square bottles are provided for honey samples. A bottle containing honey to be classified is placed in the appropriate comparator in either compartment 2 or 4 so that it will be between adjacent standards. To assist in the classification of honeys which are appreciably turbid, three square bottles containing suspensions of bentonite in distilled water are provided. These are referred to as "Cloudy 1," "Cloudy 2," and "Cloudy 3," and are used interchangeably with only one of the clear blanks to reduce the brightness of a glass standard to a level near that of the honey to be classified.

The following procedure is used in classifying extracted honey with these comparators.

(1) The clear blanks or the cloudy suspensions are placed in back of the glass standards in compartments 1, 3 and 5 of one or both of the comparators.

(2) The honey to be classified, which must be free of granulation, is poured into a clean dry bottle. The bottle is then placed in compartment 2 or 4 of either comparator box.

(3) The comparator is held at a convenient distance from the eye and viewed by diffused light (e.g., by north sky, overcast sky, or diffused artificial light source provided by a tungsten lamp or a white or daylight fluorescent lamp). The color classification of the honey is then determined by comparison of the sample with the standards. Switching the sample from compartment 2 to 4, or vice versa, interchanging the clear blanks and the appropriate cloudy suspension, and in some cases shifting to the second comparator or using both comparators, may be necessary.

If a sample is equal to the Water White standard in hue, or not as red (that is, yellower), the color is classified as Water White; if perceptibly redder than the Water White standard in hue, but not redder than the Extra White standard, the color is classified as Extra White; and so on. If redder in hue than the Amber standard, the color is classified as Dark Amber. It is emphasized that hue (amber quality or redness) is the attribute of color to be considered in this classification.

Most honeys are appreciably cloudy because of the presence of air bubbles and fine suspended matter. In such cases the brightness of a sample is lowered and its color classification may be difficult to determine particularly if its hue is near that of one of the color standards. In such cases color classification will be more easily determined if the clear blank is replaced by one of the cloudy suspensions. These suspensions are intended only as aids in the classification for color and not intended as standards for "clarity," which is one of the factors scored in ascertaining the U.S. Grade of honey. They may in some cases, however, serve as aids in assessing clarity.

The honey color comparators, complete with permanent glass color standards, clear blanks, cloudy sus-

(Please turn to next page)

pensions, and empty sample bottles, are now commercially available. Information on where they may be obtained, and additional details concerning them, may be obtained from the Fruit and Vegetable Branch, Production and Marketing Administration, U.S. Department of Agriculture, Washington 25, D.C., or from the Eastern Regional Research Laboratory, Philadelphia 18, Pennsylvania.

1. Report of a study in which certain phases were carried on under the Research and Marketing Act of 1946. Published simultaneously as AIC-307, Eastern Regional Research Laboratory.
2. Eastern Regional Research Laboratory, U. S. Department of Agriculture, Philadelphia 18, Pa.
3. Fruit and Vegetable Branch, Production and Marketing Administration, U. S. Department of Agriculture, Washington 25, D. C.
4. U. S. Dept. Agric. Circular No. 24 (Dec. 1927). United States Grades, Color Standards, and Packing Requirements for Honey Recommended by the United States Department of Agriculture.
5. U. S. Production and Marketing Administration. United States Standards for Grades of Extracted Honey. Effective March 15, 1943. Issued Jan. 30, 1943; Reissued Dec. 15, 1945. 3 p. Processed.
6. E. L. Sechrist, U. S. Dept. Agric., Dept. Circular 364 (Oct. 1925). The Color Grading of Honey.
7. B. A. Brice, A. Turner, Jr., F. L. Southerland, and E. P. Bostwick, Bur. Agric. and Indus. Chem., U. S. Dept. Agric., AIC-260 (Feb. 1950) (Eastern Reg. Res. Lab.): The Canner, 110 (6) 10-11. (Feb. 11, 1950). Permanent Glass Color Standards for Maple Sirup.
8. U. S. Production and Marketing Administration. United States Standards for Grades of Extracted Honey (Effective April 16, 1951) 12 p. Processed.
9. E. F. Phillips, J. Agricultural Research, 45, 757-770 (1932). Definitions of Honey Color Grades.

The Use of Honey in the Prevention of Polio

by D. C. Jarvis, M.D.

DO you worry about polio every summer? Are you confused each summer about what you should do when polio appears in your community? We are told by polio experts that poliomyelitis is a disease caused by a tiny virus with a preference for nerve cells. In severe form it damages or kills these cells weakening or paralyzing the related muscles. We ask ourselves why doesn't an entire family get polio? If polio spreads easily why don't more people become victims of it? Why does a child in an isolated farm house develop polio? Why is polio a summer disease? Why is there no pattern to polio epidemics?

Besides the actual muscle paralysis which may be present, the conditions now recognized in the acute stages are muscle spasm and incoordination of muscle function. Muscle spasm is a sharp contracture or shortening of the muscle, which in spasm is unable to relax and lengthen itself. During spasm the useful function of the muscle is lost.

May there not be another explanation for the appearance of polio besides the virus theory. May it not be the appearance in the child's body of a change in the child's body chemistry which the taking of honey each day may prevent. May not this change in the child's body chemistry be a disturbance of the normal relationship between potassium and calcium and also between phosphorus and calcium. Honey taken by mouth raises the blood calcium level and lowers the blood phosphorus level.

When I located for practice of medicine in Barre I soon learned there were two kinds of medicine. One was taught in medical school and was referred to as orthodox medicine. The other was passed by word of mouth from one generation to the succeeding generation and was referred to as folk medicine. I learned that Vermont folk medicine was able to treat successfully with simple remedies clinical conditions that did not respond to the therapeutic measures of orthodox medicine. Being a fifth generation Vermonter I became interested in these folk remedies of my Vermont forebears and decided to make a serious study of them. At first I could not understand the language of Vermont folk medicine but in time as I learned it I realized it was the language of applied body chemistry and applied physiology and that the most important biochemical relationships were the potassium—calcium balance and the phosphorus—calcium balance. Vermont folk medicine in its development headed straight for biochemical and physiological medicine which many believe is the medicine of the future.

Vermont folk medicine I learned was very efficient in treating clinical conditions of the muscles. These muscle conditions included twitching of the muscles, muscle pain, muscle cramps and muscle paralysis. For the treatment of these conditions honey, herb teas, apple cider vinegar and hot moist applications were used. Of these honey was most important, with apple cider vinegar second, hot moist applications third, and herb teas fourth.

The treatment of clinical conditions of the muscles is learned from animals, especially by experimenting on dairy cows who are apt to develop leg paralysis following the birth of their calf. When leg paralysis appears the veterinary gives the cow calcium gluconate in the vein with recovery from paralysis resulting. If two ounces of apple cider vinegar are poured over the ration of each cow in the herd of fifty-four dairy cows at each feeding twice a day the leg paralysis will stop appearing. When the addition of the apple cider vinegar to the ration is stopped the leg paralysis again appears in the

herd. Continued study shows that the bones of cows receiving apple cider vinegar poured over the ration are heavier and thicker when the cow is slaughtered for beef when compared with control cows. This increased thickness of bones indicates that there was an improvement in calcium metabolism in the cow's body brought about by the apple cider vinegar.

A man who has twenty-two chinchillas stated that one of his chinchillas had developed some muscle paralysis on one side of its body and would I help him. As chinchillas cost about $700 each, he naturally did not want to lose this one if it could be saved. I examined the chinchilla with him, and decided to try powdered kelp from the ocean as it is a good source of potassium the same as honey is. Some of this powdered kelp was placed in the palm of the hand and offered to the chinchilla. It eagerly took it and wanted more which was given. The following day there was less paralysis which eventually cleared up in a short time.

A doctor friend had a Scotch collie dog which he had had for ten years and of which he was very fond. This dog developed paralysis of the hind legs and had to be carried from one part of the house to the other. At my suggestion he gave the dog two units of regular insulin in the hide of the neck from an insulin syringe each day. Soon the dog recovered from its paralysis. Blood studies show that small doses of insulin raise blood calcium and lower the blood phosphorus. Honey also raises the blood calcium and lowers the blood phosphorus as shown by blood studies.

When twitching of the eyelids or the corner of the mouth appears in human beings this is an indication according to Vermont folk medicine that honey should be taken each day in order to raise the blood calcium level. The dose of honey worked out by Vermont folk medicine is a minimum of six teaspoonfuls of honey a day divided between meals usually two teaspoonfuls of honey at each meal represents the common medicinal dose. These two teaspoonfuls of honey each meal may be used to sweeten food, added to a cup of coffee, tea or water or taken direct from the spoon. If the individual likes honey more may be taken each meal. By watching the bowel action an individual may learn whether too much honey is being taken. Honey is a mild laxative. If too much honey is being taken a laxative effect on the bowel action more than is desirable will be observed. The daily dose of honey is regulated so that this undesirable excessive laxative action does not take place. The taking of honey at each meal will relieve the twitching of the eyelids or corner of the mouth in a few days depending on how long it takes to raise the blood calcium level and lower the blood phosphorus level.

When muscle aching or muscle pain is present it indicates the need of honey at each meal to bring about a disappearance of the muscle pain by lowering the blood phosphorus and raising the blood calcium. As individuals grow older they are very apt to have cramps in the muscles of the body. Often these cramps occur in the muscles of the legs and feet, especially at night. A cramp may occur in the heart which is a muscle. Blood studies show that when cramps in the muscles of the legs or feet are present the blood calcium is low. Raising of the blood calcium level by taking honey at each meal brings about a disappearance of the muscle cramps. Blood studies also show that when muscle pain is present the blood phosphorus level is too high and the calcium level too low. The pain disappears when the blood calcium is raised by taking honey and the blood phosphorus is lowered. Heart muscle pain disappears in two weeks' time when the blood calcium is raised and the blood phosphorus lowered. A medical friend in general practice reports that three unit doses of regular insulin given in the skin by an insulin syringe relieves heart muscle pain. As three unit doses of insulin raise the blood calcium level and lower the blood phosphorus they confirm what happens when honey is taken by mouth.

When sudden paralysis of one or more muscles controlling the movement of the eyes, sudden paralysis of one side of the face, paralysis of the arm and leg on one side of the body appear, all aids to raising the blood calcium and lowering the blood phosphorus are used as follows.

1. A sedative daily food intake is ordered. This means no wheat foods, no wheat cereals, no muscle meats such as beef, lamb, and pork. No citrus fruits and no citrus fruit juice.

2. At each meal two teaspoonfuls of honey are added to a glass of water. Honey in addition to raising the blood calcium furnishes the kind of sugar needed by the muscles of the body to do their work.

3. Two teaspoonfuls of apple cider vinegar are added to the same glass of water that contains the honey. This mixture of honey and apple cider vinegar is taken one swallow at a time during the meal so that when the meal is finished the contents of the glass will have been taken.

4. If the patient is an adult, one ounce of a saturated solution of potassium iodide is purchased at the drug store. Ten drops are taken in a glass of water after each meal.

5. Three units of a U40 solution of Zinc Insulin Crystals prepared for market by Eli Lilly & Co., are given once a day in the arm or other part of the body with an insulin syringe. No effort is made to time its giving. It is given when it is convenient to give it. As improvement takes place the three units of insulin are given every other day, then twice a week, next once a week and finally discontinued. Blood studies show that three unit doses of insulin raise the blood calcium level. Three units of insulin represents the dose for an adult. Less is given a child.

What may one expect from the outlined treatment when one arm and one leg on the same side of the body are suddenly paralyzed? At the end of three weeks of treatment it should be possible to raise the paralyzed arm and grasp the bars across the head of the bed with the hand. It should be possible to raise the knee of the paralyzed leg above the level of the abdomen. The paralyzed hand should be able to hold a glass of water after it has been placed there. At the end of six weeks the individual should be able to walk alone, take care of himself and go up and down stairs without assistance. He should be able to use the paralyzed hand when eating. While a cane may be used at first when walking this in time will not be used.

When the summer arrives and you begin to worry about polio and are confused about what you should do when polio appears in your community turn to the use of honey. Try and remember that it raises the blood calcium which is low when muscles twitch, cramp and become paralyzed. By raising the blood calcium level by taking honey at each meal the appearance of polio will be made more difficult for the body tissues will not represent suitable soil for the development of paralysis.

Vermont

Ancient Mead Comes Back

by Wilma Dene Eaves

THE making of mead, which has not been engaged in commercially since medieval times, a lapse of some 500 years, is now re-established as an industry in England. Mead is a winelike drink fermented from honey and water by the use of special yeasts, and was the liquor of Biblical times.

Located near the southwest tip of England, a country famous in ancient times for the quality of its mead, at Gulval, Cornwall, within twelve miles of Lands End in the valley of the River Travaylor, the new Mead Makers, Ltd. has set up business in a large old mill. Through the years of its existence, the mill was enlarged, becoming what was for a country district a good sized building—about 40,000 square feet with six floors. Restored and equipped, these Cornish granite premises have become a modern factory. The old turbine and other derelict machinery has been removed and power bought from the local electrical plant. The granite walls and roof, oak beams, joists and floors were retained, and an air filtering system was installed. Fly-proof and in the quiet country air, free from noise, dust and dirt, the old building has again come to life.

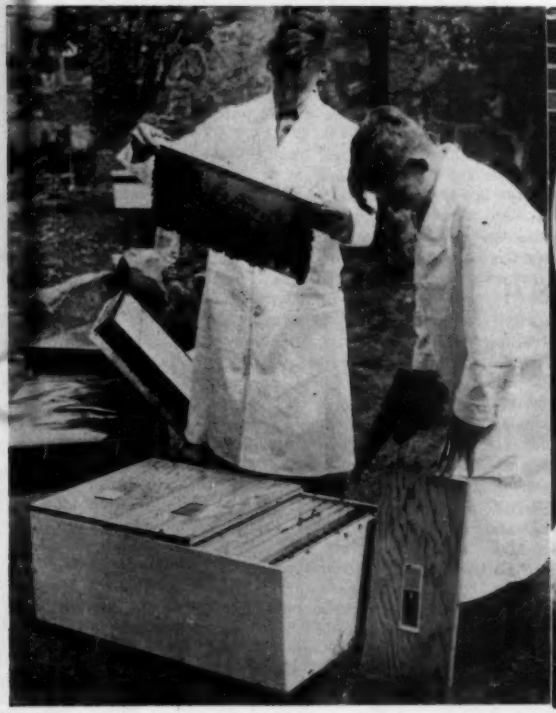
The seven floors of the building are numbered from top to bottom, including the basement, the top floor being the first floor. This system conforms to the production process which is for the most part on a gravity-flow basis.

Honey is the raw material in the making of mead. Although importing the main part of their supply of honey from Australia, the company maintains its own apiaries in Cornwall.

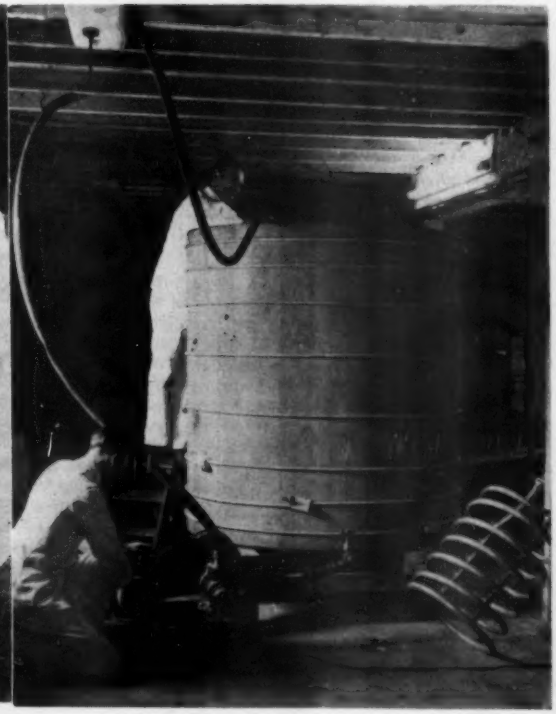
The canned imported honey and the native honeycombs are brought to the second (from the top) floor. After extraction, the honey falls by gravity to wooden storage tanks on the third floor. Canned honey is taken to the second-floor heating room, where it is warmed by hot air, and from there it falls by gravity into the storage vats on the floor below.

Honey in the storage vats is kept warm with an "attemperator" which

Honey is produced at company's own apiaries at Cornwall. Canned honey from Australia is also used.



In storage, honey is kept warm by water flowing through coils.



is a coil of tinned copper in which warm air circulates. As needed, honey is pumped up to the fermentation vats on the first floor. Here it is diluted with water and receives its charge of yeast. Now begins the primary fermentation period, during which the main alcohol content of the liquor is built up.

After this is done, a series of rackings begins, during which the liquor is carried through a number of rest periods and on through a second fermentation. The liquor travels in this process from the first floor down to the seventh floor, or lower refining and maturation cellar.

These processes require two years or more but then, the making of mead is not a rush business. In this length of time, the liquor has been resting in the oak vats on floors one to seven, or has been moving from floor to floor in the racking operation.

The mead is pumped from the lower cellar into a cold storage tank on the floor above where it is chilled and then passed through a gravity filter. The filter is not fine enough to denature the liquor. The mead is then passed on to the bottling department and subsequently to the shipping room.

The mead vats are made entirely of oak and are kept small in size to improve the quality of the liquor. On the four top floors the vat capacity is 324 gallons. On the sixth floor are the largest vats with capacities of 1,296 gal.

To clean the vessels, they are first washed with hot water, then with cold, cleansing with detergents, washing again, and finally, sulphuring before refilling with mead liquor.

Experimental work is carried on in the production laboratory located on the first floor, in the all-important manufacture of special yeasts in order to prevent troubles in fermentation. Only the finest natural raw materials are used—no flavorings, essences or chemicals—in the making of mead at Gulval. Honey varies from the protein-rich heather honey as produced by the Benedictine monks of Buckfast Abbey in Devon and the Salisbury Plain clover honeys culled from around Stonehenge, to the more highly flavored Australian "light amber" types.

Only the best vats of mead are retained as wines. The remainder are turned into a first-class, high-alcoholic content brandy. From this in turn is made the mead liqueurs, by the addition of many aromatic herbs which is contained in the medieval formula for gruit.

There are various strengths of mead, depending on the density of the honey used. In general, mead takes about 350 lbs. of honey for 100 gal. Sack mead and sack metheglin (other fermented honey drinks) take 550 lbs.

Meads are high quality liquors and the output of the Mead House is not comparable with that of a brewery. On the other hand, it is not insignificant. The plant will produce 25,000 imperial pints (30,000 U. S. pints) a month. The alcoholic content of mead, because of the special yeasts used, is naturally high and fortification is not necessary. Mead reaches 14% alcohol by volume, and sacks as high as 18%.

Mead resembles hock and Moselle wines in taste and quality. Sparkling meads are rather like champagne while sack meads taste like imperial tokay. Sack metheglins are the mead equivalent of vermouth. In addition to these types, Mead House produces the pyment and cyser of which Chaucer wrote and melomel, a Roman mead not manufactured since the time of Nero.

The man behind this romantic enterprise is Lieutenant Colonel George Robert Gayre, M.A., D.Sc., who probably knows more about mead than any other living person. An ex-artillery officer, scholar and author, Colonel Gayre has spent twelve years of study, research and experiment to gain the "know how" of the ancient mead makers. The modest "Mead House" at Gulval is the culmination of his years of planning and effort.

Mead, a fermented drink of honey and water, was known in ancient Rome where it went under the name of "Hydromel" literally "honey water." References to it in the chronicles of the Anglo-Saxons are numerous and for centuries it enjoyed unrivalled popularity in England. Later competition from cheaper wines and the Reformation in the sixteenth century caused its decline. As most of the mead makers were monks and their monasteries were destroyed during the Reformation, the art of mead making became lost. Now it is being revived by the enterprise of "Mead Makers, Limited."

Primary fermentation takes place in these oak vats with the use of special yeasts. Vat capacity, 324 gal., is kept small for highest quality mead.

A Pedigree System for Honey Bees

Walter C. Rothenbuhler, John W. Gowen and O. W. Park

Iowa State College, Ames.

RECORDS — clear, adequate, and concise — are essential in any experiment. The geneticist or breeder is in a particularly critical position with respect to the matter of records. He must be able to list every ancestor in a given individual's background to any desirable number of generations. He must be able to list every descendant of a given individual easily, quickly, and with complete accuracy. Along with such a list, genetical descriptions, records of performance, or other information may be necessary. This poses some problems not usually encountered by entomologists, but problems which practical breeders and geneticists have already faced and solved.

In ordinary livestock and other animals which may mate many different times and with different individuals and consequently produce offspring with different parentage at different times, two kinds of numbers are necessary—one for individuals, the other for matings. These are numbers having no meaning other than the fact that each one designates either a specific individual or a specific mating. They are assigned in numerical order and are filed the same way in separate places. Instead of any information about the individual or mating being included in the number, this information is recorded completely in the file under the number. Systems of numbering that carry accessory information in the number itself invariably become too complex; and regardless of how important such a system may seem before its trial, the system outlined herein will be found more concise and less complex, but adequate.

In natural mating the queen bee never mates after starting to lay, and in artificial insemination it is not the practice to reinseminate a queen after she has produced progeny. Furthermore, a given drone seldom, if ever, is used to inseminate more than one queen. These facts permit a great deal of simplification. Individual numbers may be dispensed with entirely, since a given individual normally figures in but one mating number.[2] When the first queen starts to lay, she is given mating number 1, expressed on our records as M1. The next queen to start laying gets M2, and so on.

The MATING CARD (Fig. 1)[3] is initiated when the queen cell is introduced to a nucleus. As each step in the process of developing a laying queen is accomplished, the appropriate entry is made. Finally when oviposition has started, a number is assigned to the mating represented by this queen. Mating numbers are assigned also to virgin queens that are induced to start oviposition, in the same way that they would be assigned if the queen had mated naturally or been artificially inseminated. In cases of natural mating, the source of the drone is unknown and is so recorded.

A mating number is assigned after consulting the MATING BOOK, giving the new laying queen the next consecutive unassigned number. The mating number is recorded in the appropriate space on the mating card and on the mating REGISTRY FORM (Fig. 2). The registry forms, filed numerically according to mating number in a loose-leaf binder, constitute the mating book. Ancestry and other pertinent information is recorded on the registry form when a mating number is assigned. The mating card and the registry form, having identical information with respect to ancestry, constitute some insurance against loss of this information.

In our own practice, after assignment of the mating number, the queen is designated thus: M40, M163, and so forth. It is surprising how soon one learns to associate M40 with colony 421, or M163 with colony 426.

Mating numbers lend themselves to the compilation of any number of indexes. Two such lists are practically a necessity, one based on the numerical order of mating numbers and the other on the numerical order of colony numbers. Special lists containing cross-references may be employed to any desired extent. In our own work, a list of all

Fig. 1. MATING CARD. Appropriate entries show the insemination and early oviposition records.

Apiculture I. S. C.

Nucleus 163 Condition Removed ♀ 6-4 - needs stores Year 1949

Queen from M 347 Introduced cell 6-11 Clipped 6-13 Date Wing Left

Graft No. 49-12 Emerged 6-12 Marked 6-13 Color Blue

Queen's Description	Date of Insemination	Drones From	How Many	Drones' Description	By
ivory-eye phenotype	1 6-17	M 291	4	queen eye	WR
gynandromorphic	2 6-19	M 291	4	queen eye	WR
stock	CO$_2$ 6-20			Eggs 6-24	

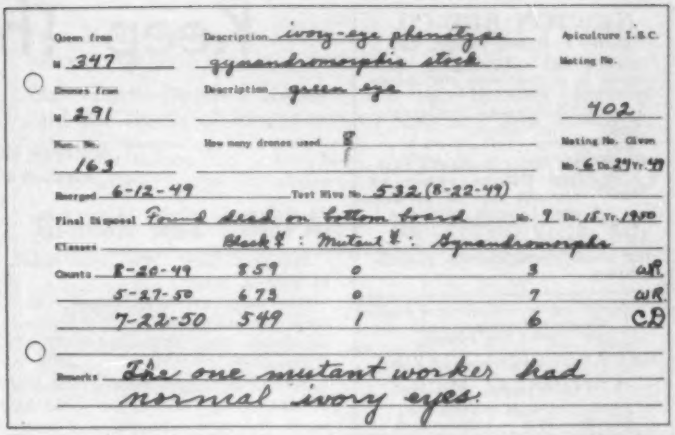
Mating No. 402 Disposal Introd. To Col. 532 Date 8-22

Date	Qn	e	l	p	Qual	Brood Quant	d in wc	d in dc	Strength	Remarks	By
6-11	0	0	✓	✓	—	1.5			2.0	Bare comb 5# Roxy	WR
7-1	✓	✓	✓	0	2.5	1.5			1.5		WR
7-10	NB	✓	✓	✓	2.5	2.0			1.5		CD
7-18	✓	✓	✓	✓	2.5	2.5			2.0		CD
7-26	✓	✓	✓	✓	2.5	3.5			2.5	Gynandromorphs-4	WR
8-1	✓	✓	✓	✓	2.5	4.0			3.0	Took 2 fr. bv. + bees	WR
8-9	✓	✓	✓	✓	2.5	3.0		33	2.0		CD
8-17	✓	✓	✓	✓	2.5	3.5		100+	2.5	Capd emerging brood	WR

progeny (from a given mating) used in further breeding has been found particularly useful.

Summary. This system of numbering matings with consecutive numbers is simple, workable, and accurate beyond any other system of which the authors have knowledge. Various simple indexes can be based on these mating numbers. Ancestors or descendants of any individual can be traced readily.

1. Journal Paper No. J-1913 of the Iowa Agricultural Experiment Station, Ames, Iowa. Project 1166. This investigation was supported in part by a research grant from the National Institutes of Health, Public Health Service. Presented at the meeting of the American Association of Economic Entomologists at Denver, Colo., Dec. 18-21, 1950.
2. If, and when, individual queens or drones are used in more than one mating number, some modification towards the system used for other animals may be necessary.
3. The forms which are reproduced here are meant to be only suggestive with regard to information other than the mating number recorded thereon.



Queen from ♀ 347 — Description ivory-eye phenotype gynandromorphic stock — Apiculture I. S. C. Mating No. 402

Drones from ♂ 291 — Description green eye

Rec. No. 163 — How many drones used 8 — Mating No. Given No. 6 Da. 29 Yr. 49

Reared 6-12-49 — Test Wire No. 532 (8-22-49)

Final Disposal Found dead on bottom board No. 9 Da. 15 Yr. 1950

Classes Black ♀ : Mutant ♀ : Gynandromorph

Counts				
8-20-49	859	0	3	WR
5-27-50	673	0	7	WR
7-22-50	549	1	6	CD

Remarks: The one mutant worker had normal ivory eyes.

Fig. 2. REGISTRY FORM. Carries the summarized, permanent record of the makeup of, and results from, a single mating. Filed numerically according to mating number in a loose-leaf binder, the registry forms constitute the mating book.

Two Hundred Years Is But a Short Period of Time

H. D. Hughes, professor of farm crops, Iowa State College, in his chapter in the book, "Forages—The Science of Grasslands Agriculture," in speaking of the time required for the introduction of a new idea, quotes the following interesting statement taken from some of the writings of William Newton Clark:

"First the idea must be seen in enthusiastic vision by someone, and enunciated for the world to hear. It must get abroad among men, and be somewhat widely considered. It must come to be deemed important. Then it must be ignored, recognized, restated, ridiculed, refuted, denied, doubted, admitted, discussed, affirmed, believed, accepted, taught to adults, taught to children, wrought into literature, put into practice, tested by its fruits, allowed to modify other ideas, embodied in institutions; and in the course of some generations, it will sink in among the certainties that are assured and acted upon without question and without thought. For this process two hundred years is but a short period of time."

But, according to Dr. Hughes, this statement was made before the days of radio, county agricultural agents, college extension divisions and their corps of specialists, and the Soil Conservation Service. He ventures the statement that we are not willing to accept today that it takes two hundred years for an idea to sink in, and states that progress toward a grasslands agriculture will be more apparent and rapid in the years ahead.

Grassland farming is building a program of row-crop and livestock production around adequate acreages of adaptable grass-legume combinations, depending on soil needs. The choice of legumes is all important, and appropriate companion grasses are selected with the legumes. Forages are the hub or pivotal crop around which the farmer plans his yearly operations. The result is inevitable conservation of the soil, improvement of soil fertility and tilth, more bushels of corn and other grains from fewer acres, improved livestock production, and less labor and machine costs.

This only can be a blessing to beekeeping. It means more and better bee pasture; increased use of honey-bee pollination in the production of larger crops of legume seed; and fuller recognition of the importance of honey bees to a more stable agricultural economy.

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Hardy, prolific, rapid build-up, best of workers. Caucasians have the longest tongue of any race. Both build beautiful white combs. BOTH ARE THE GENTLEST OF ALL RACES OF BEES. Gentleness is safest in towns, near neighbors or near streets or highways. Gentleness saves time, sweat, patience and work. Prices, both races: Untested queens $1.00 each. Tested queens $1.75 each. By Air Mail.

Discount on Quantity Orders—Ask. Begin preparing for 1952 season this month. August is a good time to requeen.

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FRAME-GRIP — SEND NOW!

This light modern tool is for easy handling and removal of frames from the bee hive. Orders promptly filled—Satisfaction guaranteed. **$3.00 plus 12c postage fee.**

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Keep That Sting!

American Honey Institute
Madison 3, Wisconsin

Stingless bees? Who ever heard of such a thing!

But there are such things. Not long ago many newspapers carried an article from Washington, D. C., that said:

"While DDT has worked wonders in destroying the apple coddling moth, the corn earworm, and many of the livestock pests that reduce milk and meat production, it has also taken a heavy toll on bees that pollinate field crops.

"To meet this situation, the bug specialists have had to look around for some new pollinizer that can substitute. Most promising candidate thus far is a Brazilian bee that hives in trees. It is smaller than the American honey bee. But it's a vast improvement on the American bumblebee because the Brazilian import is stingless."

No doubt American beekeepers read this with great interest. No doubt they wondered at the significance this influx of foreign bees might have on them. No doubt they protested that their own honey bees could do the job of pollination just as well with as good results if only farmers would cooperate in using the DDT spray wisely.

Perhaps some of them paid no attention to the fact that these Brazilian bees were stingless.

But we think that is significant. Fact of the matter is, we think it's just fine that American honey bees have stingers. We only wish that the sting would carry over into the honey jar that has been made ready for the grocer's shelves.

This is the way we look at it: Except for a pleasant buzz ever so often, honey bees are like the proverbial child who should be seen but not heard. No one would pay much attention to them, no one would notice the excellent work they do, no one would count their presence for a hill of beans. Except for the fact that they sting!

So everyone sits up and takes notice when a honey bee floats by. No one ignores her. And all because she stings!

How nice if that sting were carried over into the honey jar! How pleasant if every customer treated the honey display in a grocery store with the same respect that he treats the honey bee that makes that display possible!

By "sting" of course, we don't mean that we want honey to be marred by unpleasant tastes or odors. Nor do we mean we want the customer to feel cheated. Heaven forbid! But when we say we want the sting kept in honey we mean we want honey to have something that will make the customer aware of honey's virtues.

That "something" is aggressive selling.

Dollar-holders need to be prodded, to be urged, to be goaded before they will become dollar-spenders. The old saying has it that a horse must be led to water. So must the customer. Honey must attract its buyers not by resting passively on the shelves, but by reaching out and pulling the customer over for a second look and a final sale.

How? It's the same old stuff about good packaging, clean displays, transparent jars or wrappings, clear labels, and a good product. Old stuff, we say, but unfortunately not old enough stuff for some retailers. Honey has been known to sit in a small dark corner of a store wrapped carelessly in a sticky package and poorly labeled. Inevitably it is the owner of this honey who complains about the slow honey market.

Thanks to the American Honey Institute and others who have hammered on this idea of "how to sell, and sell out," honey is breaking its way into the ranks of the best sellers. Honey is claiming its rightful sting from the honey bee and using it on the reluctant customer.

Now, who sees to it that this "sting" is inherited from the honey bee? It is you, the beekeeper. For to produce honey is not enough; you must also see that honey reaches the people for whom it is produced.

Maybe you think that is loading

the shoulders of the beekeeper with too heavy a burden. Maybe you think that responsibility should be accepted by the grocer himself.

But can he accept it? The "sting" of aggressive selling comes in the attractive packaging of honey. You, the beekeeper, must process your own honey. The "sting" comes in a clean, sanitary product. You, the beekeeper, must keep honey pure. The "sting" comes in the liberal use of honey selling aids such as recipe leaflets. You, the beekeeper, must provide these aids for a display.

You can't "let George do it." Because there is no George who can substitute for you. The job is yours and yours alone.

The sooner beekeepers realize that honey, like every other product on the market today, must be sold — that it will not sell itself—the better off the whole honey industry will be. Efforts made by the American Honey Institute to tell beekeepers the right way to sell honey have not fallen on deaf ears. When you look back over the years, it would seem that every beekeeper has stepped into seven league boots and has made rapid tracks toward good selling methods.

But no honest beekeeper will fake the opinion that no more can be done. One trip through a large super market should convince anyone that competition between products gets constantly more keen, that there is a constant push-shove action among merchandisers to make their product more acceptable to the woman with the pocketbook. Honey must not lose out in this battle. If it does, no one will suffer but the beekeeper. If it doesn't, no one will profit more than the beekeeper.

This talk about keeping the sting in the honey jar is not idle chatter. It is serious business. But we can do no more than urge you to be on your toes. Action itself is up to you.

Drop us a post card if you would like more ideas on where to start. Let us supply you with recipe leaflets that you can buy at cost. Support our organization's program of national advertising by becoming a member of the Institute. Check your honey package against those put out by other companies and be honest in the comparison. Take a day to study good display methods; your library has books on the subject. Look for a chance to promote your honey in some special community affair. Be wise; advertise!

Let's keep that sting in the honey jar!

Our Dadant's Starline Hybrids are Genuine A.F.B. Resistant Queens and are reared to Starline Standards.

Our Three-Banded Italians are Top Quality Queens and the result of long years of selecting and breeding.

Starline Queens	1-24, $1.25	25-99, $1.10	100-up, $1.00
3-Banded Italians	1-24, $0.75	25-99, $0.70	100-up, $0.65

No extra charge for clipping, painting and Air Mailing.

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WHITE PINE BEE FARMS — Rockton, Penna.

STANDARD BEEKEEPERS SUPPLIES

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BETTER BRED QUEENS—THREE-BANDED ITALIANS

Watch those failing queens and poor colonies. Be sure and replace them with our Better Bred Stock and watch them pay off.

Queens 60c

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Calvert —:— Alabama

A FAMOUS STRAIN OF YELLOW ITALIANS

We will have a good supply of choice young queen bees ready for immediate shipment throughout the summer and fall months. Wire or airmail your orders to us for prompt, efficient service.

25% DISCOUNT EFFECTIVE BALANCE OF SEASON OFF PRICES BELOW —

1 to 5	$1.35	25 to 100	$1.15
5 to 15	1.30	100 up	1.05
15 to 25	1.20		

SELECT TESTED QUEENS — $5.00, no discount

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ITALIAN PACKAGE BEES AND QUEENS

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Smaller lots, 60c each

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Breeders Since 1932

HIGH QUALITY ITALIAN QUEENS

By Air Mail, 75c each

10 or more, 65c each

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LOOK IT OVER YOU WILL LIKE IT

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Queens	$1.00
2-lb. pkg. with queen	3.00
3-lb. pkg. with queen	4.00

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Box 251 Milton, Pa.

You Asked Us - -

I bought 5 packages of bees, one of which killed its queen and has repeatedly killed other queens introduced to it. What would you recommend doing?

Mrs. V. G. Breitenbucher, Missouri

The chances are that the original queen in the colony was in some manner killed and that the bees have reared other queens and probably have a drone laying queen in the colony. This may be why they will not accept another queen. We recommend that you move the colony to another location, remove the combs and shake all of the bees off in the grass. After this is done, move the hive quickly back to the old location so that the bees shaken off in the grass will go back to their old home. If there is a queen, she probably will not return to the old location. Then take a frame of brood in all stages from another colony and give it to the one in difficulty. This will give them a new start and they will raise a queen from the fresh brood given them.

Why do package bees with a new queen, hived on foundation, draw out supersedure cells?

J. Bruce Given, W. Va.

The bees seem to blame the queen when they are hived on foundation with no drawn cells or stores. So they try to replace her by drawing supersedure cells. When bees are hived on foundation they should be fed, or there should be some honey coming in so that they can go ahead and draw out the foundation. They cannot secrete the wax unless honey is coming in or they have sugar sirup. When there is only foundation in the hive, the queen has no place to lay. Even if the bees draw out a little comb, the queen soon fills the cells with eggs. Unless the comb is drawn quickly and the queen has plenty of space to lay, the bees blame the queen believing that she is not doing well in building the strength of the colony. So they draw supersedure cells. A brood chamber can be congested with foundation just as it can be crowded with brood and honey. In either case, the queen has no place to lay.

Would it pay me to buy sugar at 9c a pound and feed it to my bees and sell the honey on the market?

W. R. Cove, Georgia

Experiments along this line have never proven profitable. The cost of the sugar and the loss experienced by the bees consuming a considerable part of the sugar sirup for their own use have made it impractical.

More important than the cost, however, is the fact that honey produced by feeding either cane or beet sugar **would not be pure honey.** Any producer who would use this method of securing honey would violate the Pure Food & Drug Act which is rigidly enforced. Therefore, this kind of production would be neither profitable nor safe.

As I understand it, clipping a queen's wings prevents absconding, but what will prevent afterswarming?

Carlton C. Sargent, Maine

Clipping the queen does prevent swarming for the time being as the queen cannot fly. The bees may try to swarm, but the queen can usually be found on the ground outside of the hive. But often, when a queen's wing is being clipped she is injured some other way. The bees will tolerate a crippled queen only so long, then they replace her by supersedure. When the young queen hatches she will kill the old queen and then in time the bees could swarm.

The best way to prevent swarming is to examine colonies every ten days during swarming season and destroy all queen cells. Bees swarm instinctively and a congested brood nest and poor ventilation encourage it.

If there are two main honeyflows there will probably be two swarming seasons.

Can too much smoke be used to quiet bees when inspecting them?

Harold Doore, Iowa

The beekeeper will learn just how much smoke to use on the bees as he becomes familiar with them. Using too much smoke causes bees to become excited, boil over the hive and start crawling. Some hives require very little smoke, others more. Two or three puffs of smoke in the entrance before opening the hive and two or three puffs under the lid when it is lifted should be enough. Let the lid down again and wait a few moments before opening again. Then use smoke sparingly from time to time as needed.

How can I best transfer five swarms of bees from boxes and kegs to modern hives?

L. Askew, Ohio

The best and quickest way it to tear up the old boxes and kegs, take the layers of combs out and shake the bees into new hives. Of course, if they are put on foundation they will need to be fed until there is plenty of nectar coming in. While you are shaking the bees into the new equipment, watch for the queen. Sometimes, during the procedure, the queens will be injured or killed. If this happens, purchase a new queen and introduce her into the hive as soon as possible. The old combs can be melted up for beeswax. Spring is the best time to transfer the bees, before they have too much brood and honey.

What is the best way to get rid of undesirable drone comb and brood?

Paul L. Lange, Texas

When combs contain a large amount of drone cells, cut out the comb and install fresh foundation. Sometimes the top may be scraped off the sealed drone brood with a hive tool. The bees will then carry the larvae out. But of course, the drone cells are still there which will produce more drone brood later. Sometimes drone brood results because there is a defect in the indentations in foundation if the foundation has been damaged or mashed. Or if the foundation doesn't fill the frame down to the bottom bar the bees may draw drone cells there.

SUNKIST

Light colored Italians or Kelleys Island hybrids.
Airmailed — postpaid — clipped: 65c each.
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HOWARD WEAVER'S CAUCASIAN QUEENS

1 - 24 ..... $1.00
25 - 49 ..... .90
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No charge for clipping or marking. Air mailed on request.
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BESSONET'S "GULF BREEZE" ITALIANS

It is time to prepare your hives for 1952. "GULF BREEZE" queens are bred right — selected and shipped right. Introduce GULF BREEZE and feel assured that you have good queens.

Prices: 1-24 ... 80c each 25 up ... 75c each air mailed.

BESSONET BEE COMPANY, Donaldsonville, Louisiana

CAUCASIANS UNLIMITED

Will be available throughout the summer. Order from this schedule and save time. Prices effective June 1st for the balance of the season.

1 to 11 at $1.00 each
12 to 49 at .90 each
50 to 99 at .80 each
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ITALIANS $.50 each Airmail

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YORK'S QUALITY BRED ITALIAN QUEENS

The Strain that Leading Honey Producers Prefer

1-24—$1.00 each 25-99—85c each 100 up—75c each

None better regardless of price

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(The Universal Apiaries)

Renew Your Subscription Now To A-B-J

Jensen Says,—Requeen Now!

Requeen any time a queen is found doing poorly. But for wholesale requeening better pick a time when some nectar is coming in for best acceptance of the new queens.

Getting at least two cycles of brood hatched before cold weather slows up egg laying, is fine wintering insurance. More winter losses are attributable to poor queens than any other cause except the lack of proper stores.

Reg. U.S. Pat. Off.

"Magnolia State" Italians		Dadant's Stock Starline D.R. Hybrids
1-24	95c each	$1.20 each
25-99	85c each	1.10 each
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"The Business Quality and Service Built."

AUGUST LOTZ COMPANY

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The LOTZ SECTION

No finer section made for producing fast selling comb honey.

GLASS JARS

	Queenline	Economy
5-lb. Jars, per reshipping carton of 6		$ .59
2-lb. Jars, per reshipping carton of 12	$ .76	.68
1-lb. Jars, per reshipping carton of 24	1.15	1.00
½-lb. Jars, per reshipping carton of 24	1.04	.92

TIN CONTAINERS

Friction Top Pails with Bails

5-lb. — Per Carton of 50 — 12c each	$ 5.30
5-lb. — Per Carton of 100 — 12c each	10.40
10-lb. — Per Carton of 50 — 17c each	7.50
Box of Two 60-lb. Square Cans	$ 1.75
60-lb. Square Cans, in bulk, each	.60
60-lb. Square Cans, per carton of 24	14.40
Screw on Honey Gate for 60-lb. can—2½"	2.00

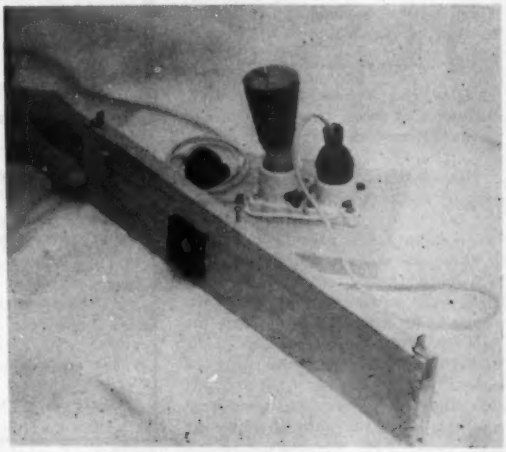
10% discount on orders of $100.00 —
5% discount on orders of $50.00

How - to - do - it

Try Honey . . . .

I read with great interest the articles in the A. B. J. by Dr. Jarvis on the medicinal value of honey and I decided to make an experiment. From time to time I am afflicted with athlete's foot. Since this is a fungus disease, I reasoned that an application of honey should kill the fungus. I then put a few drops of honey on the affected areas and the results were amazing. The itching stopped immediately. Five applications in four days cured the disease. Some honey soaked into the socks and shoes and killed the fungus there. It was not at all unpleasant or messy. No more foot powder for me.

Joseph Jachman, Illinois



Wire Embedder . . . .

Here is an electric portable wire embedder that is easy to build and operate at small expense. The only trick in building it is to wire the two sockets and the embedding board in series. The plug to the left fits into 110 or 120 A.C. volt line. The coil is 600 watts or a regular electric heater coil. Two wires come out of the right hand plug; wire number one goes to and through the doorbell knob and onto the leg or contact point on one end of the embedding board; wire number two goes direct to the other leg on the opposite end of the embedding board. These legs or contact points are pieces of sheet copper, thick enough to stand a little pressure to push the warm wire into the foundation. The doorbell knob makes or breaks the electric circuit so that the correct heat can be controlled to embed the wire into the foundation. It will require from three to seven seconds to embed the wire.

The wood screw between the two electric legs is not connected to any electricity but is a pressure leg, adjusted to place some pressure on the wire and to hold the wire in place while the heat is applied. By being a little neat in building this embedder, you can cut a groove in the embedding board and run the electric wires in the grooves out of sight.

Ed Marion, Oregon

Dr. Warwick E. Kerr - Visiting Bee Geneticist

by Harry H. Laidlaw

University of California, Davis

THE honey bee, because of its haploid-diploid sex relationship as well as its economic importance, is attracting the interest of an increasing number of geneticists. One of the well-known geneticists of other lands is Dr. Warwick E. Kerr, Livre-Docente in the Department of Genetics, Escola Superior de Agricultura "Luiz de Queirez", Universidade de Sao Paulo, Brazil. Dr. Kerr, who was granted a Fellowship by the Rockefeller Foundation for genetic studies in the United States, has spent three months of his fellowship at the University of California at Davis where, in collaboration with Dr. Melvin Green and the writer, he engaged in analyzing the eye color mutants which have been accumulating at that institution the past three years. He has been conducting some experiments on inducing mutations by X-rays, and has gained experience in artificial insemination and the routine of operating a bee breeding program.

Part of Dr. Kerr's fellowship will be spent at other research centers where bee breeding is in progress, and the greater part will be utilized in study under Dr. Theodosius Dobzhansky, Professor of Genetics, Columbia University, New York City.

Dr. Kerr's training has fitted him admirably for research in bee genetics. In 1944 he undertook cytological studies in the stingless bees of Brazil, the biology of which he had studied earlier. His search for material led him to make three interesting trips into the interior of his native land. His first trip was in 1948 to the states of Maranhao and Para, and Amapo Territory (where he visited three tribes of Indians) in North Brazil to collect species of stingless bees and determine their geographical distribution. The second trip was made in 1949 to central Brazil south of Minas Gerais State to determine the geographical distribution of **Melipona quadrifasciata**, and to collect **Melipona marginata**. The third trip, also in 1949, was to Bolivia and the state of Mato Grosso in west Brazil to collect stingless bees and determine the geographical distribution of **Melipona quadrifasciata**. His knowledge of the stingless bees has been put to good use by Mr. George Vansell and Mr. Joseph Reinhardt of the Pacific States Bee Culture Laboratory at Davis where the pollinating activity of Brazilian stingless bees is being studied.

Dr. Kerr is one of the youngest Livre-Docentes in Sao Paulo. This degree which was conferred upon him in 1950 corresponds to the degree of Doctor of Philosophy in this country. He had the title "Doctor" before that, however, as the equivalent of the Master's degree is in Brazil "Doutor", and he was awarded this degree in 1948. In 1945 he was graduated from the University with the degree of Engenheiro Agronomo which corresponds to the Bachelor of Science degree in Agronomy in the United States.

Only Livre-Docentes and full professors are eligible to teach in the Universidade de Sao Paulo. Dr. Kerr teaches laboratory classes of cytology, statistics, and genetics, and post graduate courses.

We, here at Davis, were delighted to find that Warwick (as we call him, though we haven't succeeded yet in persuading him to be as informal with us) has a keen sense of humor and can appreciate the jokes on both us and his own countrymen. He reads English fluently and is rapidly mastering the inconsistencies of spoken English, or perhaps it is better to say the American language. Perhaps he comes by this naturally since his grandfather Kerr was an American engineer who went to Brazil to work on the construction of railroads and who married there and made Brazil his home. Warwick has a pretty wife and two lovely daughters of whom he is understandably proud.

We are happy to have had Dr. Kerr with us and to learn to know not only one representative of the Brazilian people quite well but also to learn much about his country. He is a most successful ambassador of good will, and we hope he finds the American people as cordial and likable as we have found him.

William Atchley Passes on

Word has been received of the death of William Atchley at Upland, California. Mr. Atchley was in his late seventies but until a few months ago had still been active in his beekeeping.

The Atchleys have long been known in the honey and beekeeping business, in fact, ever since the early days of beekeeping in this country when Mrs. Jennie Atchley and the E. J. Atchley Company operated in Beeville, Texas, from whence Mr. William Atchley moved to California.

Snodgrass Active . . .

R. E. Snodgrass will be remembered for his life work on anatomical studies of the honey bee as epitomized by his book "Anatomy and Physiology of the Honeybee" as well as his very thorough chapter in the latest edition of "The Hive and the Honey Bee."

Mr. Snodgrass retired from active duty some time ago but he has not been idle. His latest work is a 125-page paper bound book published in 1951 entitled "Mandibulate Anthropods — Comparative Studies on the Head."

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A MARKETING OUTLET FOR ALL TYPES OF YOUR HONEY.

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We are in business to serve you.

Visit our plants.

Ogden, Utah; Idaho Falls, Idaho; Denver, Colorado; Los Angeles, California; Phoenix, Arizona; and our Wood Goods Mill in Madera, California.

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PACKAGE BEES AND QUEENS

3-Way Italian Hybrid Combination—High Production

Resistance to A.F.B.
Uniform Colony Performance

Reg. U.S. Pat. Off.

Stock of Dadant & Sons
Reared Under Ideal Conditions

Quantity	Starline Queens	Packages with Starline Queens 2-lb.	3-lb.
1-24	$1.20	$3.50	$4.50
25-99	1.15	3.25	4.25
100-999	1.00	3.00	4.00

For additional bees add $1.00 per lb.

Wicht Reliable 3-Banded Italians

Lower Prices — For our own reliable 3-Banded Italian Queens and Packages with Queens, deduct 25c each from the above price schedule.

Prices of Our 3-Banded Italian Queens	
1-24	95c
25-99	90c
100 up	75c

All queens are clipped and marked unless requested not to.

WICHT APIARIES

406 Miller St. —:— Hattiesburg, Miss.

SERVICE QUALITY DEPENDABILITY

3-WAY HYBRID QUEENS

Requeen your colonies with the queens developed on Kelleys Island, Ohio.

We have recently received new breeder queens and plan to have queens available all Fall.

Do not confuse these queens with other Hybrids. Specify Kelleys Island 3-Way Hybrids.

Prices for balance of season — 3-Way Hybrid or Regular stock postpaid.

1- 26	$1.00 each
26-100	.90
100 up	.85

We wish to thank our many customers for the nice business given us this spring. If you were pleased tell others, if not tell us. It is our desire to please.

ROSSMAN & LONG

P. O. Box 133 Moultrie, Ga.

REQUEEN NOW

As soon as you get your honey off, requeen those colonies. A vigorous young queen will mean a lot of young bees this fall for good wintering. Don't take a chance on an old worn-out queen.

ITALIANS CAUCASIANS
ITALIAN HYBRIDS

— PRICES —

1 -24	$ .75 Each
25 -99	.70 Each
100-Up	.60 Each
Tested Queens	1.50 Each

Queens Postpaid, Airmailed and/or Clipped —No Extra Cost

THE STOVER APIARIES

Mayhew, Mississippi

This is the Month

by Frank E. McLaughlin

ALL spring it has rained nearly every day. This made everything grow well but kept the bees from bringing in the honey they should have, even though there was plenty of bloom for them to work. The rain washed the nectar from the blossoms and the temperature stayed very cool through all of June. Early in the spring, our prospects for a good honeyflow were very good. But on the first of July the outlook was very discouraging. Too much rain and cool weather.

We had an experience down at Cloverdale Gardens this summer that never happened to us before. Lightning struck one of our beehives. We had a section super on top of the colony. The lightning made a small hole through the lid, and seemed to explode inside the hive. Several sections in the super were splintered. The front of the hive body was pushed out and splintered. Even the nails in the hive body were pulled out and all the frames were down on the bottom board. One of the boards in the bottom board was pushed out and even the boards the hive rested on were split. Most of the brood was dead, but a lot of the bees were all right and so was the queen.

So you see the wind isn't the only thing that can create havoc in the bee yard during summer storms.

Extracting the Honey Crop

August is usually the month when the early honey crop is extracted in most localities. I hope everyone has some honey to extract this season. It takes really strong colonies of bees, a location where there is plenty of bloom to work, and weather favorable to nectar secretion to produce a good crop. Here in the Midwest our summer honeyflow depends largely on the clovers—white and yellow sweet, alsike, and white Dutch.

Be sure your honey is completely ripened before removing it from the bees. It should be at least three-fourths capped over, and in some localities, especially in damp rainy weather, it is better to leave the honey on until it is completely capped. In rainy weather the honey will probably have a high moisture content and might ferment if taken off the bees too soon.

There are several methods used to remove supers of honey from the bees. One way that is especially used by the commercial beekeeper is the acid board method. For an experienced beekeeper, using carbolic acid to run the bees down out of the supers is much faster than other ways of getting the bees out. But for the inexperienced beekeeper or the beginner, I would not suggest the use of acid, as it burns the skin very badly and if left on the super too long will penetrate the honey and make it taste.

Another method of removing honey is to use a bee escape in the hole in the inner cover, leaving the hive undisturbed for a day or two, then removing the super when the bees are all down out of it. Still another method is to brush the bees off the frames with a bee brush, placing each brushed frame in a covered empty super. Keeping as much of the equipment covered as possible prevents robber bees from getting to the honey.

After extracting, if the combs are not to be put back on the hives to receive more honey, they can be set on above a queen excluder and an inner cover (hole uncovered) and the bees will clean up the combs. This should be done during a dearth of nectar. The bees will more readily clean up the combs then, and will not store more honey in the extracted combs.

For the beginner who has only a few supers of honey to extract, a small two, three, or four-frame extractor is large enough. There are several types of uncapping knives used to cut the cappings off the honey. The plain uncapping knife, kept hot in a pail of water, is fine for the beginner to use.

After extracting the frames of honey, the cappings should be drained thoroughly and melted up into beeswax as soon as possible, to prevent moth from getting into them.

The room where the honey is extracted and taken care of should be kept clean and sanitary. The containers, straining cloths, and all equipment should be kept clean, also. Plenty of clean water is a necessity for washing hands and equipment.

Storage of honey before and after extracting should be in a dry place, at moderate temperatures where the honey cannot absorb moisture.

After the honey is strained it may be bottled in any size sterilized containers. Most beekeepers use one, two, three and five-pound glass containers, and five and ten-pound metal containers. The more attractive the container the more sales will be made.

Some beekeepers heat their honey and some do not. It is said the honey will not granulate as fast when heated. However, overheating will ruin honey. It should not be heated above 160° Fahrenheit, and it is better to heat it to only 140° to 150° Fahrenheit. The heating is done by placing the can of honey in a larger container of water (double boiler method) on a stove and gradually heating it to the desired temperature, then cooling it as soon as possible. A good dairy thermometer is excellent to use to know when the desired temperature is reached.

I will be glad to try to help anyone with any specific bee problem. Write me in care of American Bee Journal.

CLARENCE S. McREYNOLDS

1890-1951

Clarence S. McReynolds, prominent, Minnesota beekeeper and active president of the Minnesota Beekeepers' Association for two years, passed away in mid-April of this year, after suffering a stroke of apoplexy while working in one of his Texas apiaries.

He was born in Kokomo, Indiana, and educated there and later at Moorhead Teachers' College. After teaching school for ten years he became interested in beekeeping, increasing his colonies until he could devote his entire time to commercial honey production in both Texas and Minnesota.

Mr. McReynolds received a citation from the Minneapolis Star for his contributions to Minnesota agriculture. He served as Representative in the Minnesota Legislature for three terms, was a World War I veteran, and a member of the American Legion and Gideon Society. He is survived by his wife and one daughter, and by two sons who are carrying on the bee and honey business.

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1-24	90c	$1.20	$4.00	$5.00	$6.00
25-99	90c	1.15	3.75	4.75	5.75
100 up	75c	1.00	3.50	4.50	5.50

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American Bee Journal

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All Around The Bee Yard

by G. H. Cale

This morning it would be hard to get to some bee yards, not to mention getting all around in them Since midnight it has been raining great guns. Since early spring it has been raining, sometimes almost every day. Herbert Hoover's big tussle with the central river floods during his days with the Government was nothing like the havoc by "Old Man River" this year of 1951.

A billion dollars is a lot of money, too many dollars to count in one lifetime, and it is likely that property and crop and other flood damage is now well towards that figure. The twenty-five million entrusted to Truman for flood relief may only cover the most urgent aid and rehabilitation.

Beekeepers must have sustained loss, perhaps of bee yards, certainly of crops, as reports come in from parts of the river basin area in the Midwest that crops are short or nil because of damage to plants by rain or weather that prevented nectar gathering. However, conditions elsewhere have been fair to good so the total crop, granting a larger than usual fall flow, may be greater than in 1950.

Excessive moisture usually results in nectar with a large water content. That is true this year. When flow conditions are good, the number of supers needed when nectar is thin is above normal. Also the time required for condensing the nectar to honey with a desirably heavy body is extended beyond the time usually needed and the supers must remain on the colonies longer. So you have a bad situation—more than the usual number of supers and a longer ripening time. Some colonies get stacked up pretty high and ripening goes so slowly that the bees may often seal honey that is still somewhat "green".

Removing well sealed honey (supers with most combs entirely sealed) and then giving additional supers helps considerably. Also extracting the well sealed honey and returning the wet supers is a way out when supers are short. Wet supers always seem to stimulate storing more than dry supers. High stacks of supers seem to induce crowding in the lower supers. Ideally it is better to have four or five supers, extracting the thoroughly ripe honey and returning the supers when it can be done, than it is to have higher stacks through the entire flow. The bees do a better job of storing and ripening and they have their work to do in an area easier for them to handle.

This has been a fine year for section and bulk comb honey. There is a rapid flow of nice white honey in our locations with less tendency to induce swarming under crowded conditions. However next year may be less favorable in the usual cycle of "off" and "on" years. Then drawn combs will be very valuable and foundation may not be accepted readily. Any producer is fortunate when he has a location where comb honey may be produced easily year after year, with few exceptions. A super adapted to extracting combs one year and bulk comb another is a good piece of equipment. Section comb honey supers, of course, may be used or not as conditions warrant.

Having supers right at hand at the time they are needed most seems to me to be as essential as good queens and heavy colonies. More producers fail to recognize the importance of this and so supers are put on only after a delay in need and the result is a loss of honey. I think a good plan for bees not right by your elbow, is to put up simple platforms in each yard and get extracting supers into the yards early in the season, covering the stacks of supers on the platforms against rain and sun. Then they are right at hand when they are most needed.

Note the editorial on page 327 about the Institute banner. The color is part of it. One is tacked up before me. The expression on that kid's face is one of real enjoyment and the honey on his bread and butter drips off the crust. Just like a kid with an ice cream cone. Then too this particular kid is crowned "king for the day" and why not? Hasn't he the food of "kings"? Just a brief message (prime measure of good advertising) "Everyone enjoys honey". The word honey is bold yellow on medium brown; the flower motif is just enough to set the mind to the source of all honey. Golly, "It's a honey."

It has been a European foulbrood year. Cases of this disease have shown in yards where, as far as we know, there has never been any before. The source of the stock seems to be of little consequence. Some of the diseased brood is still present although the honeyflow has been of several weeks' duration. American foulbrood may be entirely eliminated from almost any location but European has the bad habit of showing up after a long absence, appearing where it has never been before; persisting some years, only slightly noticeable in others. It is an elusive, puzzling, exasperating will-o'-the-wisp. At times it sweeps through a colony like flood water sweeps away debris; and all methods to control it seem of little use. Who will help us out of this dilemma? Will the cure be a drug? Or will it be resistance?

Contrarywise, we have seldom had a year with less American foulbrood; just six cases in two thousand colonies, in four entirely separated locations!

This has been a good year for honey from white Dutch clover. They do come along at intervals of ten to fifteen years here with us. It is a long time to wait for a flow from this source. In these river valleys the main crops used to be pretty much from fall flowers, with white Dutch years once in a while. Then sweet clover became general and the emphasis was shifted to the summer crop of whiter honey. Meanwhile drainage of valley lands and more intensive farming and finally weed sprays almost removed the sources of fall honey.

Also the emphasis on so-called table grades of sirupy white honey gave the darker honey a black eye. To me this discrimination is ridiculous. Many amber honeys taste swell and are much richer in trace elements vital to good food than whiter honey. After all the way to the stomach is through the mouth.

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5 lb. with queen	6.00	5.75	5.50
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Packages are shipped with full liberal over-weight and live arrival guaranteed. Our dealings with you must be 100% satisfactory. Replacement or refund on any shipment when bad order receipt is received by us. Our queens are second to none in performance. Queens clipped on request and sent airmail postpaid.

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Queens ITALIAN Queens
Nice Large, Laying Queens
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What's Going On

Palmetto State Beekeepers Assc.
Annual Meeting
Room 106, First Floor
Old Chemistry Building
Clemson Agriculture College,
Clemson, S.C.

Wednesday, August 15, 1951
(Prof. David Dunavan, Chairman In Charge)

Address of Welcome, 8:30 to 8:40 a. m., D. W. Watkins, Director, Extension Service, Clemson.

Beginning With Bees, 8:40 to 9:00 a. m., M. J. Deyell, A. I. Root Co., Medina, Ohio.

Assembling Beekeeping Equipment, 9:00 to 9:30 a. m., G. W. Vest, G. B. Lewis Co., Lynchburg, Va.

Management of Colonies For Maximum Production, 9:45 to 10:15 a. m., W. A. Stephens, State Apiarist, Raleigh, N.C.

Marketing Your Honey Crop, 10:15 to 10:45 a. m., David Dunavan, Associate Entomologist, Clemson.

GENERAL ASSEMBLY — 11:15 a. m., College Chapel.

Demonstrations at College Bee Yard, 2:30 to 5:30 p. m. Near Fruit Stand Junction. Routes 76 and 123.

Yard Management for Bees or for Honey Production.

Transferring Bees from Box Hives to Modern Equipment.

Shaking Package Bees.

The Requeening of Non-productive Colonies.

Clemson College Entomology and Apiary Leaders In Charge.

Thursday, August 16, 1951
(Mr. W. H. Purser, Chairman In Charge)

The Use of Bees In Pollinating Ladino Clover, Reseeding Red Clover, Cucumbers, and Cantaloupes, 8:30 to 9:00 a. m., W. H. Purser, Assistant Bee Specialist, Clemson.

Panel Discussions on Control of Apiary Diseases and Other Pests, 9:00 to 9:30 a. m., G. C. Gaskin, Pres. Palmetto State Beekeepers Association.

Question and Answer Period for All Types of Questions on beekeeping and Related Subjects, 9:45 to 10:45 a. m., Clemson College Entomology and Apiary Leaders In Charge.

GENERAL ASSEMBLY — 11:15 a. m., College Chapel.

Demonstrations at College Bee Yard. 2:30 to 5:00 p. m. Near Fruit Stand Junction. Routes 76 and 123.

Treating Apiary Equipment for the Control of Pests In the Bee Yard, W. H. Purser.

Rearing Young Queens for Use In the Bee Yard Or for Sale. C. G. Ellison, Queen Breeder, Belton, S.C.

48th Annual Beekeepers' Field Day and Picnic
Pennsylvania State Beekeepers' Association
Cook Forest State Park
Cooksburg, Pennsylvania
August 18, 1951

The entrance to the park is at Cooksburg on State Highway Route Number 36. Traveling from the east follow U.S. Highway Route Number 322 to Brookville, then north on No. 36 to the park entrance. Traveling from the west follow U.S. Highway Route Number 322 to Clarion, turn north on State Highway Route Number 966 to No. 36, turn east on 36 to park entrance. Those coming from northwestern Pennsylvania may wish to follow Route 36 from Titusville or Tionesta.

Program 9:30 to 12:00 P. M.

Registration, 9:30 to 10:00 a. m.

Meeting, 10:00 a. m. Called to order by President Merle P. Fisher, Granville.

Welcome, Russell M. Smith, County Agent, Forest County, Tionesta.

Inspection Progress in Pennsylvania in 1951, H. B. Kirk, Senior Entomologist, Harrisburg.

Honeydew Poisoning of Honeybees, Prof. E. J. Anderson, in charge of Bee Culture Research, State College.

Pollination of Garden Vegetables, W. W. Clarke, Jr., Extension Apiarist, State College.

Helpful Remarks, George H. Rea, Reynoldsville, Pa.

Basket Lunch 12:00 P. M.

Light refreshments (lemonade and coffee) will be served by Crawford and Wenango County Beekeepers' Associations. Meals are available at the Cook Forest Inn.

Games and Contests
1:30 to 2:30 P. M.

Games and contests will be in charge of Prof. Anderson. The schedule will be followed promptly so that the tour through the park can be started at 2:30 p. m.

Reg. U.S. Pat. Off.

MILLER REARED-DADANT STARLINE HYBRID QUEENS

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BRED IN ISOLATED YARDS

Starline Queens ..... 1-24, $1.30; 25-99, $1.15; 100 up, $1.00
Italian Queens ..... 1-24, 95c; 25-99, 90c; 100 up, 75c

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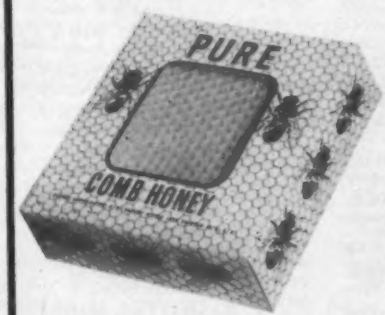

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Market News

by M. G. Dadant

Crop Compared to 1950

On the southeastern seaboard, except for Maryland, the crop has turned out as well, or perhaps a little better than in 1950. Georgia reports 10 per cent more and except for a somewhat lighter orange flow, there is a 25 per cent better flow in Florida so that the total honey crop will, no doubt, be greater. The southern states generally and Kentucky and Tennessee report better crops so far than a year ago. Arkansas also is better, and Louisiana about as good.

While the vetch flow was extremely heavy where vetch was available, the Hubam flows have been disappointing largely through the stripping of the leaves by insects. This applies particularly to east Texas. Undoubtedly, the total honey crop in Texas will suffer as a consequence.

In all of the northeastern states and extending through the Central West, and into the Rocky Mountain section, the early flows have been badly disconnected on account of continuous cool and rainy weather. In spite of that, the flows up to July 15 have succeeded in giving a better honey crop than at the same date in 1950. In some cases where the showers have missed and the weather has been favorable, even 200 pounds to the colony is reported.

Montana and Idaho similarly are late with no flow, but colonies are in good condition. Colorado apparently is one of the states which does not have much and does not expect much except perhaps along the western slope. European foulbrood also had been a great deterrent there. New Mexico and Arizona are below average. Washington and Oregon bees are largely devoted to pollination, but propects are excellent. The same is reported for northern California, where the crop so far is about 10 to 20 per cent under last year. Orange flows throughout the state perhaps are about equal to last year, but in the southern and central sections, the desert weeds have suffered on account of the lowest rainfall in a long time, and many bees are being moved to other sections.

In the Canadian provinces, most sections have no report yet on actual honeyflow except that Quebec is reporting already having harvested a much larger crop than the total of last year.

Prospects

There is not much left in prospects throughout all of the Southeast except for the cotton growing sections, where there is a mixed feeling on account of the danger of poisoning. Many bees will have to be moved and many, no doubt, will be poisoned in this section. This applies as well to Texas, New Mexico, Arizona, and even southern California.

Virginia and the Carolinas report excellent conditions to come. This applies largely to all of the Northeast and Central West where if other conditions were favorable during late July and early August, the white honey crop should have materialized and made a good crop, if not a bumper one. Buckwheat seems to be a little more scarce in Pennsylvania and New York than a year ago. Throughout the central western areas and into the intermountain sections, conditions on July 15 looked excellent for honeyflows to come.

In northern California, prospects are good for alfalfa and other flows. The number of bees going into pollination, no doubt, will cut the crop some, but most producers are still in areas where colony production is considered rather than heavy seed yield through overpopulation of bees.

Prospects in all of the Canadian provinces seem much better than last year and no doubt the total crop with anything like decent weather conditions in July and August will go above last year.

Carlot Movement

Outside of some carlot movement in Florida, the shipments are concentrated in California where the movement has been fairly good. There has also been some movement of old honey still to be sold. In fact, the government report as of July 1 is to the effect that nearly a million pounds of honey was shipped abroad during June. Likely some of this was California's and Florida's early crops, but most of it was probably last year's honey.

No one but the uninformed beekeeper is asking less for his honey than the ceiling price which now amounts to about 9½ and 10½ cents. Naturally, the small producer who cannot gather together a carload has been in some instances offering his honey at a little less than ceiling.

Honey Prices

California prices are reported on orange honey at from 10 to 12 cents delivered common point, depending on the grade of the honey.

We learn of several carloads of white moving at 10½ cents for old crop, with an offer of 10¾ in Montana for carloads of new crop.

The shortage of the Hubam crop in Texas and Arkansas did affect many of the packers down there who had plenty of bulk comb honey from the vetch, but needed a little extracted to go with it. As a consequence, there seems to be for the time being a "scramble" for extracted honey, and prices of 12 cents delivered are being offered. This is quite in line with the ceiling price plus freight that would have to be paid to get the honey into that territory.

On the whole, beekeepers, we believe, are expecting the price on good white honey to run not less than 10½ cents, and from there up to 12 cents a pound f.o.b. their shipping point or delivery closeby.

Summary

All in all, apparently the crop is going to be as good as a year ago which in itself was one of the largest crops we have ever produced, and this in spite of the fact that there likely are fewer colonies than there were even in 1950. The reason for the larger total crop is that beekeepers have been on the job getting their bees into condition. The crop arrived late and allowed the bees to build up perfectly for the honeyflows.

Honey Wanted— Cars and less than car. Top Prices.
C. W. Aeppler Co., Oconomowoc, Wis.

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QUEENS OUR SPECIALTY—Italians, 50c each; Carniolans, $1.25 each; Caucasian, $1.00 each. All queens shipped by Air Mail and guaranteed to please. Walter D. Lervette, Ex. 304, Ft. Pierce, Fla.

BREWER LINE-BRED Caucasian queens —1 - 24, $1.25; 25 - 99, $1.15; 100 up, $1.00. Booking orders for April 1. Brewer Bros. Apiaries, 3624 Caucasian Circle, Tampa 9, Florida.

YANCEY HUSTLER Three-Band Italians —Bred for business. Select queens, $1.00 each; $9.00 per dozen. Guaranteed to please. Caney Valley Apiaries, Bay City, Texas.

GOLDEN QUEENS—$1.00, Airmail: 24 to 48, 50c; 50 and up, 40c. O. E. Brown, Rt. 1, Asheboro, N. C.

THREE BANDED Italian bees and queens—Best of quality and extra good workers. 2-lb. with queen, $3.50; 3-lb. with queen, $4.50. Select untested queens, 1 to 25, $1.00 each; 25 up, 90c each. A trial order will convince you. Phone 4703, Alamance Bee Co., Geo. E. Curtis, Mgr., Graham, N. C.

GOLDEN ITALIAN BEES AND QUEENS —Real gentle and good workers. 2-lb. with queen, $3.50; 3-lb. with queen, $4.50. Select untested queens, 1 to 25, $1.00 each; 25 up, 90c each. Health certificate with every order. Carolina Bee Farm, Graham, N. C.

CAUCASIAN QUEENS—One, 75c; ten or more 60c each. Tillery Brothers, Greenville, Ala.

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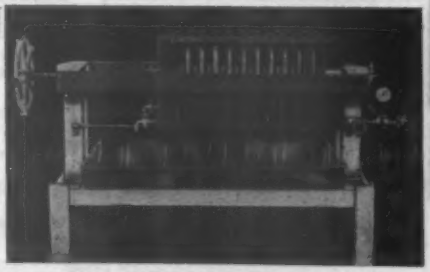

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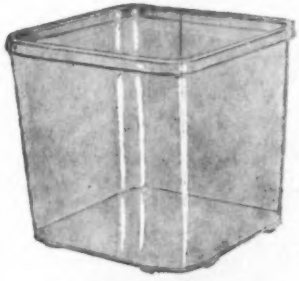

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